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HE SLEEPS WITH THE BIRDS

A peep at Guy C. Caldwell, carefully and (he claims) comfortably tucked away for the night in his hammock in the treetops. (Described on page 31)

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CHANGE OF ADDRESS

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WHITE OAK PLANTED TO HONOR ROOSEVELT'S MEMORY

The sixty-second birthday of former President Theodore Roosevelt was commemorated at Oyster Bay by representatives of various societies and organizations who planted a white oak tree near his grave.

The ceremony was arranged by the New York Bird and Tree Club and was conducted with the consent of Mrs. Roosevelt.

Many prominent men and women took part and the first shovelful of earth was thrown upon the roots by Mrs. Thomas A. Edison, in behalf of her husband.



Underwood and Underwood

PLANTING THE WHITE OAK

Others who attended were Lord and Lady Rathcreedan, of the British delegation to the Tercentenary Celebration of the landing of the Pilgrims, who placed a wreath upon the grave.

The tree planting launched a movement initiated by the organizations to have trees planted throughout the country on Mr. Roosevelt's birthday in memory of the former President and other illustrious Americans.

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EDITORIAL

FOREST PROGRAM PROGRESSES

THE movement to perpetuate the forest resources of the United States through the adoption of a comprehensive national forest policy continues to progress. Within the last few months the essential features of the program outlined by the Forest Service in the so-called Capper report on timber depletion submitted to the Senate last spring have been endorsed by a considerable number of interested and influential groups. AMERICAN FORESTRY has already presented the results of the meeting held in New York in October at which the entire matter was discussed at length and unanimous agreement on the essentials of a Federal legislative program was reached by representatives of the American Paper and Pulp Association, the National Lumber Manufacturers' Association, the National Wholesale Lumber Dealers' Association, the Association of Wood-Using Industries, the American Forestry Association, the American Newspaper Publishers' Association, and the United States chamber of Commerce.

Since then the proposed legislation has also been endorsed by seventeen state forestry organizations, by the Southern Pine Association, the Society for the Protection of New Hampshire Forests, the National Fire Protection Committee, the Western Forestry and Conservation Association and others.

A month later a well-attended conference of State forestry officials at Atlantic City endorsed the recommendations of the Forest Service relating to co-operation with States in fire protection and forest renewal, and urged upon Congress the enactment of legislation, accompanied by suitable annual appropriations, to make those recommendations effective. Both the State Foresters and the group of interests represented at the October meeting in New York appointed steering committees to do all in

their power to further the proposed legislation. A meeting of the committee representing the latter was held early in December at which the entire ground was covered in considerable detail and definite plans for further action approved.

There is thus a united movement in which timber producers, timber consumers, foresters, and the general public are well represented to secure the Federal legislation fundamental to the adoption of a national forest policy which will provide an adequate and permanent supply of timber for the people of the United States. So strong and well organized is the movement that it seems almost certain that bills looking to this end will have been introduced in Congress before this issue of AMERICAN FORESTRY reaches its readers. In urging their vigorous support of the legislation proposed we wish also to emphasize the fact that Federal legislation alone will not solve the problem, and that to be really effective it must be supplemented by State legislation in the timber-producing States.

This is obvious when it is remembered that the keynote of the whole program is local as opposed to national control, and that the proposed Federal appropriations for fire protection and forest renewal are to be available for co-operative work with the States only when the latter have enacted legislation making such provision for the same purposes as is satisfactory to the Federal Government. State action is, therefore, absolutely essential if the Federal legislation is to be made effective in practice.

Clear recognition of this fact, accompanied by vigorous efforts to secure the adoption of appropriate legislation in the various States, is vital to the success of the entire movement.

SAVE THE REDWOODS

NO less important than the protection of the National Parks already in existence is the setting aside of other areas which should be maintained in their virgin state as a national heritage. Among these are the magnificent redwoods of the California coast, one of the most impressive of the natural wonders of the country. Small groves of the bigtree, the sister tree of the redwood which is found in the Sierra Nevada Mountains, are now included in the Yosemite and Sequoia National Parks, and it is to be hoped are safe for all time. Red-

wood proper, however, is practically all in private ownership, aside from a relatively few trees included in the National Forests of northern California and in the Muir Woods, near San Francisco. These do not comprise the finest or most representative specimens, all of which are privately owned and are being rapidly destroyed through the progress of lumbering operations.

The Save the Redwoods League is conducting a vigorous campaign for the acquisition through donation and purchase of certain areas of the most typical primitive

redwood forests now left to be preserved as National and State Parks for the enjoyment not only of this, but of all future generations. These redwoods lie in Humboldt, Del Norte, and Mendocino Counties in northern California along the route of the new State Scenic Highway. Many of them tower 300 feet into the air, the tallest of living things. Many of them have witnessed the coming and going of untold generations of men. The opening of the Scenic Highway has made them for the first time readily accessible to the general public, and at the same time has emphasized the imminence of their

complete destruction by commercial interests. The object of the Save the Redwoods League to preserve adequate areas of these majestic trees in National and State Parks, as well as to establish memorial groves and to protect the redwoods and other timber along the Scenic Highway, deserves the heartiest support. The two Sequoias, the redwood and the bigtree, remnants of a species that once flourished in many parts of the world, are now the unique possession of the United States. They are a heritage that should be preserved for the enjoyment of generations yet to come.

FOREST EXPERIMENT STATIONS

FOR over a year the American Forestry Association has been endeavoring to further forest research in the United States through the establishment of a comprehensive series of properly manned and adequately equipped forest experiment stations.

European countries long ago recognized the necessity of experimental work as a basis for the intelligent management of their forests. Agricultural experiment stations in the United States have proved their value through the development of better methods and increased yields. The most progressive industrial organizations have acknowledged the importance of research by establishing research laboratories as private enterprises. Forest experiment stations are as necessary to forest management. They will furnish the basis for better methods of planting trees, of securing natural young growth on cut-over and burned-over areas, of increasing the rate of growth and yields of our existing forests, and of protecting them from the ravages of fire, disease and insects. If our forests are to be effectively perpetuated as sources of the wood so universally used in manifold forms in American economic life and as conservers of the water so essential to agricultural development on irrigated lands, the best methods for handling them must be determined by thoroughly organized and systematically conducted research.

Each important forest region of the United States should have an experiment station located within it, to study the local problems. The plan which the Association hopes to see adopted provides for ten such stations so distributed that practically the entire permanent forest area of the country can be conveniently studied. It includes a station for the northeastern States, one for the Alleghenies, one for the Lake States, one for the southern pine forests of the South Atlantic and Gulf States, one for the Southern Appalachian hardwood region, one for the Inland Empire, one for the central Rocky Mountains, one for the southwest, one for California, and one for the Pacific Northwest.

Not only is the improved management of these forests which can be made possible through research important to the industries and communities directly dependent upon them for their continued welfare and even existence, but also to the people situated far from the forests. Those in the prairie regions, for example, receive a large

part of the lumber necessary for building purposes of all sorts from the southern pine forests of the Gulf States and from the Douglas fir forests of the Pacific Northwest. Even such regions as New England and the Central States now receive a considerable share of their timber from the South and West.

During the sessions of last winter and spring bills were introduced in both Houses of Congress providing funds for the establishment of forest experiment stations, under the direction of the Secretary of Agriculture through the Forest Service, in five of these regions, namely, the Northeastern States, the Southern Appalachian Mountains, the Southern pine region, the Lake States, and California, in the last two regions in co-operation with the Universities of Minnesota and California.

The bills were referred to the Committees on Agriculture and Forestry, where they are still reposing, awaiting a call to action. Many local people in various regions took an active interest in these projects last year but it was not sufficient to force them to the front. Are we to secure their passage during the coming session of Congress? It will require greatly increased efforts to secure favorable consideration for these bills among the many that are demanding early attention.

Not only were these bills not acted upon last year but the appropriation for forest investigations of the Forest Service, an item in the Agricultural Appropriation Bill, was cut more than a third. As a result the experimental work at the Forest Service experiment stations which have been established on a small scale for several years in Arizona, Colorado, Washington, and Idaho, had to be practically abandoned. This winter the Association is working also to secure the re-establishment of adequately supported forest experiment stations in these four regions. This season's campaign is well started. Encouraging responses have already been received, but much more general and more active support must be obtained in order to secure the introduction and passage of measures to realize the establishment of these stations.

Forest experiment stations are one of the essential parts of a national plan to assure the perpetuation of the forests. Their value should be evident to every user of wood or its products whether city dweller or farmer, whether he lives in the shade of the forest or in the cities hundreds of miles from the source of supply. This

is a matter in which all our readers should be interested. Let that interest have a definite expression in bringing

to the attention of Congress this opportunity for passing constructive measures.

PRESERVE THE NATIONAL PARKS

THE National Parks, set aside as permanent recreation grounds for the people of the entire country, are threatened by commercial invasions from two distinct sources. The Federal Water Power Act, which finally became a law last spring, in addition to many constructive features, contained a provision authorizing the Water Power Commission to issue licenses for the construction, operation, and maintenance of dams, reservoirs, power houses, and other project works in the National Parks and Monuments on exactly the same basis as in National Forests and other public lands. That the possibility of commercial development afforded by this provision constitutes a very real danger to the integrity of the National Parks is clearly indicated by subsequent developments. The City of Los Angeles, for example, has already filed with the Water Power Commission applications for storage reservoirs and power house sites on Merced Lake in Little Yosemite; for a diversion of Buena Vista and Illilouette Creeks, and a storage reservoir just below Wawona, and for reservoirs in Virginia and Tuolumne Canyons. The Sierra Club has stated that "there is only one thing worse that could be done for the complete commercialization and ruin of the Yosemite National Park, and that is the damming and flooding of Yosemite Valley itself!"

The present Secretary of the Interior has declared that this tendency to commercialize the National Parks should be "resisted to the utmost," and the Water Power Commission has voted to entertain no application for power licenses in the National Parks and Monuments pending further action by Congress. Secretaries and Commissions change, however, and there is no assurance that the present policy may not be reversed at any time without notice. Real assurance that the National Parks will be saved from commercialization by the water power interests can be secured only by amending the Water Power Act so as to make this impossible.

The other threatened invasion of the Parks comes from the irrigation interests. During the last session of Congress the Smith Bill (H. R. 12,466), granting easements for dams, reservoirs, canals, and other irrigation works in the Yellowstone National Park was passed by the Senate and reported favorably to the House. The irrigation interests by which this bill was promoted wish to flood immediately an area of nearly 8,000 acres in the Bechler River and Falls River Basins in Yellowstone Park, and eventually to use also other parts of the Park. Pressure for the passage of the bill was accompanied by gross misrepresentation. Thus the two basins which it is proposed to flood were described by its advocates as swampy and the whole region was said to be of absolutely no scenic value. Later investigation proved the "swamps" to be a veritable campers' paradise of beautiful meadows interspersed with pleasant woods and

bordered by one of the most remarkable and lovely series of waterfalls in any of the National Parks!

While in theory the Smith Bill upholds the basic principle of Park protection by directing the secretary of the Interior to confirm the easements which it grants only in so far as they would not interfere with Park uses, the fact remains that should any Secretary at any time make such easements effective, his action could not be subsequently reversed and the damage done would be irrevocable. It is also clear that the Smith Bill is exceedingly dangerous because of the precedent which it sets, and that if it becomes a law similar concessions by irrigation interests will be eagerly sought in other parts of the National Parks.

These proposed raids on the National Parks raise a fundamental question of national policy. Are the Parks to be distinguished in their use from other public lands, and if so how? The underlying motive in their creation has been the desire to preserve forever in their primitive condition a few widely separated examples of the American wilderness as havens into which the people can occasionally escape from the grind of the work-a-day world for recreation, inspiration, and the study and enjoyment of our native wild animals, birds, and plants living natural lives in the natural homes of their ancestors. Unlike the National Forests, which are handled principally for economic purposes, the distinguishing feature and at the same time the greatest value of the National Parks lies in the very fact that they are consecrated to recreational, esthetic, and scientific ends to the exclusion of those commercial activities which elsewhere rule supreme. If the camel's nose of business is ever allowed to enter, no matter in what guise, it is only a question of time when this distinction will disappear.

Altogether only one-quarter of one per cent of the area of the continental United States, exclusive of Alaska, has been set aside through the creation of National Parks and National Monuments for non-economic purposes. Surely this is not an unreasonable area to devote to the preservation of some of the finest and most inspiring examples of wild life and of natural scenery in the country. If the United States should ever reach the point where its natural resources properly handled are unable to meet the economic needs of its people, it will then be ample time to consider whether the basic idea of the National Parks should be abandoned and commercial exploitation permitted. Certainly that time has not yet been reached. Until it is the dividends received from the Parks as such through the development of the spiritual, mental, and physical strength of the people will be of far greater value than the comparatively small commercial advantages which could be derived from their economic utilization.

Elihu Root was right when he wrote, in connection

with another attempt to utilize one of the Parks for an object foreign to the purpose for which it was created, "Many years of conflict . . . against all sorts of incursions have shown me that the only safety is in beating back every invasion." To help preserve the integrity of the National Parks by beating back the present invasions by the water power and irrigation interests should be the duty of every far-sighted American citizen.

Both the Water Power Act and the Smith Bill are dangerous because they place the future of the Parks in the hands of administrative officials without opportunity for appeal, and because they violate the fundamental principle for which the Parks were established. Only through amendment of the former and defeat of the latter at the present session of Congress can the very real dangers by which the Parks are threatened be averted.

THE MENACE OF THE WHITE PINE BLISTER RUST

WHEN the white pine blister rust first made its appearance in the United States the predictions of those who uttered warnings as to the possibility of its doing serious damage to the white pines of the country were taken, in many quarters, with several grains of salt. Since then the situation has been studied so carefully and the feasibility of control measures has been investigated so thoroughly that it is now possible to draw conclusions based on the solid foundation of established facts. The latest developments in connection with the progress of the disease, as brought out at the Sixth Annual International Blister Rust Conference, held at Boston in November, under the auspices of the American Plant Pest Committee, must convince even the skeptics that the blister rust is not to be scoffed at.

It is now clear that in the Northeastern and Lake States at least the blister rust has come to stay. Throughout these regions, where white pine and currants and gooseberries occur on the same area, the white pine is in real danger of attack. Sample strips run in New England and New York during the last year indicate that approximately 10 per cent of the pine stands are already infected. Furthermore, a hasty survey of conditions throughout these States has indicated that wherever currants and gooseberries occur the disease is also present. There is, therefore, every probability that the present infection will increase rapidly, particularly where local climatic and vegetative conditions are favorable for its spread, unless energetic control measures are undertaken promptly. The damage caused by the disease is of two main sorts—it kills the smaller trees, up to approximately 20 feet in height, whether in the nursery, in plantations, or in natural stands, and it decreases the rate of growth of the larger trees. In severe cases it may even result in the death of the latter.

White pine, one of the most important commercial trees of central and southern New England and of large areas in New York and the Lake States, is thus in imminent danger of having its value very materially decreased. Fortunately the results of work undertaken during the past few years have shown that its control is possible by the eradication of currants and gooseberries, from which alone the pine can be infected, and the value of which is obviously much less than that of the latter. Experience in New England during the past year has proved that such eradication is not only feasible but that with adequate organization it can be conducted

on a considerable scale at the very reasonable cost of about 25 cents per acre. While the cost elsewhere has so far been higher, it is still moderate in comparison with the magnitude of the pine values involved. In those areas where currants and gooseberries are present there is, therefore, no excuse for not protecting the pine by undertaking their eradication.

West of the Great Plains the situation is very different. There more species of 5-needled pines occur, all of which are highly susceptible to the disease. Currants and gooseberries are found throughout the region in a wide variety of species, many of which reach the size of large shrubs, the eradication of which, under any conditions, would be difficult. This emphasizes the importance of maintaining with the utmost strictness the quarantine which the Federal Horticultural Board has established at the Mississippi Valley prohibiting the shipment of currants, gooseberries and white pines to States west of this line. During the past year several wilful violations of this quarantine have been detected. Shippers of nursery stock should co-operate heartily with Federal and State authorities in preventing shipments beyond this line, and the latter should use every means at their disposal to see that the quarantine is rigidly enforced. Only in this way can the tremendously valuable stands of the various white pines in the Rocky Mountain and Pacific Coast States be protected.

Several things stand out prominently in the present situation. The white pine blister rust is a real menace to white pine stands throughout the eastern United States. This menace can be reduced or eliminated completely by the local eradication of currants and gooseberries. The danger to white pines in the far Western States is still greater than to those in the East, should the disease ever become established there. It can be prevented from doing so only by the strictest enforcement of the present Federal quarantine prohibiting shipments of white pines and currants and gooseberries into that territory. It is, therefore, of the utmost importance that Federal, State, and local authorities, nurserymen, timberland owners, and the public generally should co-operate heartily in using every effort to eradicate currants and gooseberries in those parts of the eastern United States where white pine is of commercial importance, and to prevent the introduction of the disease into the West.

SAFEGUARDING THE WHITE PINE CROP

BY SAMUEL B. DETWILER

WHITE pine can be protected from serious damage by the blister rust, but action must be prompt.

This is the substance of the conclusions reached by the Sixth Annual International Blister Rust Conference recently held in Boston, Massachusetts, under the auspices of the American Plant Pest Committee. Experiments begun in 1916 demonstrate that this disease is effectively controlled locally by destroying wild and cultivated currant and gooseberry bushes within 200 to 300 yards of the pine. Local control is practicable because the spores which cause the infection in the pines are very delicate, living only ten minutes or less, even under favorable conditions. Simple methods of field work have been developed which insure destruction of over 95 per cent of the wild currant and gooseberry bushes, which abound in white pine regions. The cost of control work averaged only 35 cents per acre on more than a quarter million acres covered in 1920. East of the Great Plains, the disease is permanently established and spreading rapidly, but any body of white pine may be protected locally, at moderate cost. The white pine blister rust has not been found in the far West. The hope of saving the western white pine forests from infection lies in strict enforcement of the Federal and State quarantines.

The conference was well attended and great interest was shown in the many phases of control work. All of the New England States, New York, New Jersey, Wisconsin, and Minnesota were represented officially, as well as the United States Department of Agriculture. Representatives of a number of forestry and plant pathological organizations in the United States and Canada also took part. The conference opened with brief reports by the State and Federal officials on the

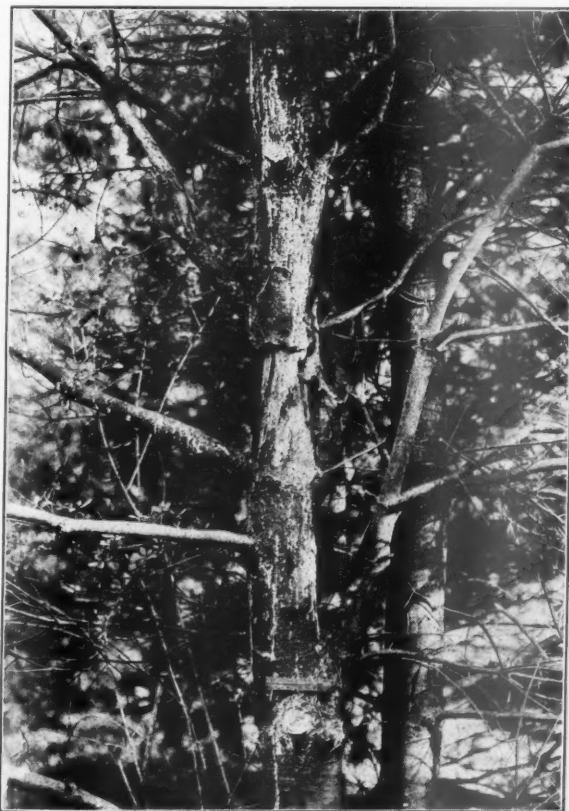
progress of co-operative control work. Results of scouting for the blister rust in thirty-three States, and control work in nine States, were summarized. This was followed by reports on pathological investigations of the disease by Dr. H. H. York, Dr. L. H. Pennington, Dr. Perley Spaulding, Dr. G. P. Clinton, Dr. Walter H. Snell, and Dr. Haven Metcalf. The remainder of the

program dealt with various aspects of local control of the disease in infected regions, including a resume of experimental work conducted by the Office of Blister Rust Control, United States Department of Agriculture, and papers embodying constructive suggestions on the many details of the practical field work.

As a result of five seasons' experimental work, it was shown conclusively that the removal of currant and gooseberry bushes from the vicinity of pine stands effectively controls the blister rust. The proof of this fact is among the most important data presented to the conference. This report was made by Dr. William E. Pickler and Mr. L. W. Hodgkins, of the Office of Blister Rust Control, as a result of re-inspection of the control area at Lenox, Massachusetts.

In 1916, currant and gooseberry bushes were uprooted extensively in the vicinity of Lenox, Massachusetts. This was the first attempt at local control of the blister rust by eliminating all of these secondary hosts of the blister rust from a large territory. Con-

sequently, the workers lacked training and experience, and the work resulted in the removal of not more than 70 to 80 per cent of the wild currant and gooseberry bushes. Since 1916, this work has been standardized so that an average efficiency of 95 per cent of the wild currants and gooseberries are destroyed in once going



WHITE PINE BLISTER RUST CANKER ON A TRUNK SIX INCHES IN DIAMETER

White pine blister rust is caused by a parasitic fungus imported from Europe twenty years ago. In 1915 and 1916, it was discovered to be widely distributed in New England and northeastern New York, with spot infections in Minnesota, Wisconsin, Ontario and Quebec. Since 1916, experimental control on a large scale has been carried on in the New England States, New York, Wisconsin and Minnesota, in close co-operation with the United States Department of Agriculture. Control of the blister rust is possible because the disease does not advance directly from one pine to another. It must pass through a period of development on the leaves of currants or gooseberries (*Ribes*) before it can harm healthy pines. Therefore, the essential feature in control work is to destroy wild and cultivated currant and gooseberry bushes adjacent to the pines.



Photograph by A. B. Brooks.

PULLING WILD GOOSEBERRY BUSHES WITH THE DERBY HOOK

Large bushes like this one are well anchored and require considerable labor to uproot. The work is made easier by special implements invented for the purpose. Many of the bushes are smaller and less expensive to destroy. The average cost of clearing the land of wild gooseberry and currant bushes was 35 cents per acre in 1920. This low cost was obtained by employing scientific methods in locating wild currant and gooseberry bushes. Costs are expected to be still further reduced in areas where wild bushes are very numerous, as a result of successful experiments in destroying such bushes by spraying them with chemicals.

over an area. In the summer and fall of 1920, Dr. Pickler and Mr. Hodgkins conducted a survey to determine the effect of control work done at Lenox four years before. They made a similar survey in an area from which the currant and gooseberry bushes have never been removed. This area is located in the Berkshire region, at New Boston, Massachusetts, not far from Lenox. Climatic conditions in these localities are similar. Careful inspection was made of 20,605 pine trees under 20 feet high. Plots consisting entirely of young pine growth were selected, so that each tree could be thoroughly examined, and every white pine on the plot was included in the survey. The resulting data show that since 1916, with not to exceed 80 per cent of the currants and gooseberries removed, the rate of blister rust infection is approximately 2100 per cent less at Lenox than at New Boston, where no bushes have been removed. Blister rust infection at New Boston, since 1916, has taken place at the rate of 571 blister rust cankers in 10,000 pines. At Lenox, in the same period, the rate has been only 26 cankers in 10,000 trees, or less than one-twentieth of the amount of infection found at New Boston. It should be noted that in and surrounding the survey plots at Lenox, an average of 47 currant and gooseberry bushes per acre was found in 1920. The average height of these bushes, however, was only 1.3 feet. It is apparent, therefore, that when the Lenox area was

covered by the crews in 1916, small bushes were missed and others have since developed from seeds and sprouts. Dr. Pickler classified the bushes according to origin, and found that 18 per cent had been overlooked in 1916, 62 per cent were seedlings that grew since 1916, and 20 per cent were sprouts that developed as a result of breaking off the tops of the bushes instead of uprooting them.

The results of Dr. Pickler's study merely confirm the conclusions previously reached by scientific investigators. It has long been known that the blister rust must pass through two stages of development on currant or gooseberry leaves, before it can infect the white pine trees. At last year's conference, Dr. H. H. York reported that he found the sporidia which produces the disease in the pines, to retain their germinating power for a period of *less than ten minutes*, even when the humidity and temperature are favorable to long life of

the spores. This explains the reason that under ordinary forest conditions, currants and gooseberries do not need to be uprooted farther than 200 to 300 yards from pines.

In the majority of cases, currants and gooseberries cause infection on pine trees only within a limited radius. This is demonstrated by studies made of the percentage of pine infection in the zones around isolated currant and gooseberry bushes, or groups of bushes. With the



Photograph by A. B. Brooks.

A FEW SKUNK CURRANT PLANTS FROM A CONTROL AREA

Skunk currant grows as a mat of tangled, prostrate stems in moist localities. The bushes shown were pulled by a crew and piled for burning. Although finding and uprooting the skunk currant plants is tedious work, the inspectors find that the crews do it efficiently. On 77 acres of swampy land, a crew removed 34,752 skunk currant plants in the first working, and only 46 additional plants were found when the checking crew went over the ground again.



Photograph by A. B. Brooks.

DIGGING A WILD GOOSEBERRY BUSH "TWELVE FEET HIGH"

This bush grew twelve feet above the ground, in the crotch of the branches of a large maple tree. The seed from which it developed probably was carried by a bird or chipmunk. Bushes that grow like this one are curiosities. Practically all of them are found on the ground. One crew discovered a gooseberry bush growing in a chimney on top of a house.

exception of the European cultivated black currant, it has been found that the destructive effect of such bushes does not usually extend beyond 300 yards, and frequently does not exceed 100 feet, depending on conditions. It was therefore the opinion of the conference that a zone 200 to 300 yards in width, cleared of currant and gooseberry bushes, will insure the commercial growing of white pines, under average conditions.

The cultivated black currant is so highly susceptible to the blister rust, and produces such tremendous numbers of infecting spores, that the conference declared it to be a serious public nuisance, and exceedingly detrimental to the growing of white pine. The conference therefore advised that State legislation be provided for the general destruction of this species in pine-growing sections. The conference urgently recommended the removal of all currant and gooseberry bushes within at

least 200 yards from white pine stands, by every owner of white pine, State, Federal, and all other agencies interested in perpetuating white pine as a crop. This was recommended not only for sections where the disease is now present, but in all other white pine areas east of, and including Minnesota.

Reports of extensive surveys made in the Northeastern States in 1920 developed the rather startling fact that in large areas, an average of 10 per cent of the pines are already attacked by the blister rust. The first infection on these areas dates back to 1906 in some cases, and up to 1911 in others. The data on which the percentage of infection is based, was obtained by examining the white pines growing on a strip 99 miles long and one rod wide. This strip consisted of four separate lines extending from Littleton to Woodsville, and Piermont, New Hampshire; Wells River to Barnett, Vermont; Lewis to near Ausable Forks, Essex County, New York, and in the vicinity of Ipswich, Massachusetts. In addition to the strip lines, 296 quarter-acre plots, adjacent to the line, were examined. A total of 45,840 pines were inspected for the blister rust, about half of this number being on the plots. On the strip lines, infection averaged 7.4 per cent, and on the plots, 28.1 per cent. It is apparent that at least 10 per cent of the pines are infected in the regions covered by the surveys.



Photograph by A. B. Brooks.

DIVING FOR SKUNK CURRANTS IN A BRUSH PILE

A member of a crew that is removing skunk currants from an area recently logged, finds a bush beneath the slash. The crews develop a competitive interest in their work that adds to efficiency. A crew member who is highly proficient in finding currant and gooseberry (*Ribes*) bushes under difficult conditions, is given the honorable title of "Ribes hound" by his fellow workers.

A total of 930,348 acres were cleared of 12,927,494 currant and gooseberry bushes in the New England States and New York from 1917 to 1920, inclusive. In 1920, 267,076 acres were brought under control in these States, and 11,672 acres in Wisconsin and Minnesota. The owners of cultivated currants and gooseberries have shown a fine spirit of co-operation in destroying their bushes, even when the pines thus protected are on adjacent property. In New Hampshire, 43,377 cultivated bushes were uprooted in 1919 and 1920, and 2,130 owners, out of a total of 2,139 signed cards, releasing all claim to compensation from the State. Pine owners and communities in pine-growing sections are financially co-operating in control work, and many individuals are protecting their pines without assistance. A total of \$25,344 was subscribed by local co-operators in New Hampshire, New York, Massachusetts, and Vermont. The voters of 50 New Hampshire towns appropriated \$8,421 and individuals in this State subscribed \$5,168 additional.

In 1920 the cost of control in all States averaged 35 cents per acre as compared with 54 cents in 1919, and 66 cents in 1918. These cost figures include labor, supervision and transportation of field men. In the New England States in 1920, the total cost per acre ranged from 16 cents in Rhode Island to \$1.24 in Vermont, averaging only 23.6 cents per acre for these six States. The cost of the work varies considerably according to the number of bushes per acre and other conditions. In New England, there was an average of 13 bushels per acre, 98 in New York, and 178 in Minnesota. The results of three years' ex-

periments in killing currants and gooseberries with fuel oil and dip oil indicate that much expense will be saved by the use of these oils, instead of uprooting the bushes by hand. Other experiments now in progress give promise of greatly reducing costs where conditions are most difficult.

The cost per acre of control work has decreased and the efficiency has increased each year. This has been accomplished through improved methods and effective field organization under the direction of the State officials in charge of this work, in co-operation with the United States Department of Agriculture. The bushes are uprooted by crews of laborers under the direction of a trained foreman. Uniform efficiency is secured through systematic checking. Every day or two the crews check part of the area they have already worked. At times, a special checking crew goes from one control area to another, making complete checks of large-sized blocks.

The currant and gooseberry bushes removed by a crew in each working of an area, are recorded by number and species for each "block" or small subdivision of the control area. This enables the checking crew to determine the percentage of bushes removed by the crew which first covered the area. A "complete check" means that the area has been gone over many times until no more bushes are found, not even tiny seedlings. In 112 such checks covering 316 acres, 65,014 bushes (97 per cent) were destroyed in the first working of the plots. Only 1,965 bushes (3 per cent) were found in going over the area three to five times after the first working. Five other methods of checking are used. In



EFFECT OF A BLISTER RUST CANKER ON A FINE WHITE PINE

This tree is twenty feet high. It was infected with the rust eight years before the top died. The blister rust is an insidious disease. A tree is severely diseased before the infection becomes noticeable to anyone not expert in detecting the cankers. Blister rust infection on pine in the northeastern states is increasing rapidly. A strip survey in one locality in New Hampshire indicates that one-fourth of the pines on an area of 72 square miles are already infected with the rust. The disease is also widespread in Minnesota, Wisconsin, Ontario and Quebec. There is abundant evidence of the destructiveness of the blister rust to merchantable trees as well as young white pine stands. This destruction is caused by infected currant and gooseberry bushes near the pines. The longer such bushes remain, the more rapidly pine infection increases. After several years, all of the trees becomes infected and gradually die.

1920, in the New England States, 682 checks were made by these various methods, on areas totalling approximately 6,000 acres. The crews that went over these areas the first time destroyed 97.2 per cent of the total number of bushes.

In Wisconsin and Minnesota, white pine blister rust is widely distributed on currants and gooseberries and is attacking pines at a number of points. In Minnesota infected currants were found as far north as Tower



Photograph by A. B. Brooks.

ONE YEAR OLD SPROUTS OF WILD GOOSEBERRY BUSH

This growth resulted from breaking off the top of a large bush. The crews use specially constructed digging implements and the entire crown of the bush is taken out and hung up so it cannot grow again. Wild currants and gooseberries do not reproduce rapidly in an area that has been worked by an efficient crew. Thorough checking on 2485 acres in 8 separate tracts previously gone over by eradication crews, showed that on an average acre, 82 bushes (95.5 per cent) were destroyed in the first working and 3 bushes in the second working. Of the latter, two bushes were missed in the first working, and one bush developed from seeds or sprouts. Bushes missed by the crews usually are small plants growing in underbush. Such plants have less leaf surface than the average plant; therefore, the total percentage of protection to the pines is considerably greater than the total per cent of currant and gooseberry bushes destroyed.

and as far west as Grand Rapids. Local control areas were established in these States in 1920, resulting in 11,672 acres cleared of currants and gooseberries at an average cost of \$1.04 per acre. During the past season, no blister rust was found outside of the above-mentioned States, with the exception of two "spot" infections on black currants in New Jersey. The "spot" infections found in Michigan and Pennsylvania in previous years appear to have been successfully eradicated, and in New Jersey the disease is apparently under control.

The Rocky Mountain and Pacific Coast forests are as yet apparently free from the white pine blister rust.

During the past three seasons, 146,929 white pines, and 318,093 currant and gooseberry plants have been traced and inspected in the far West. These plants were shipped from infected regions prior to enactment of quarantines, and were, therefore, possible carriers of the blister rust. None of these were found to be infected with the disease. Active scouting for the blister rust is in progress on wild currants and gooseberries and introduced host plants, but no signs of the disease have been found. Sixty-five species of currants and gooseberries are indigenous to western North America. Out of this large number, there are species adapted to nearly every site condition existing in these regions, and they afford an unbroken chain for the dissemination of white pine blister rust, if the disease is once introduced into this region. A single shipment of diseased pines, currants or gooseberries may result in enormous losses, both to pri-



A CREW UPROOTING WILD CURRANT AND GOOSEBERRY BUSHES TO PROTECT NEARBY PINE STANDS

The men work in line formation, the spacing between men varying according to character of the land. The number of men in line varies from four to six, although for most conditions, five men is considered preferable. Small bushes are pulled by hand, and larger ones dug up with specially constructed "Ribes picks." The foreman follows closely in the rear of the crew and checks their work. The work of each crew is also checked frequently by Federal inspectors. As a result of many large-scale experiments, modifications of the general method have been developed. Thus, there are special "stone-wall crews," "checking crews," "advance Ribes scouts," a "head linesman," and a "chemical crew." The methods are not elaborate, and unskilled laborers, working under a trained foreman, quickly learn to do excellent work.

vate and Government holdings. Sugar pine, western white pine, and limber pine, the three most important five-leaved pines in the West, are known to be highly susceptible to the white pine blister rust. The conference, therefore, urged that great attention be paid to the strict enforcement of the Federal quarantine prohibiting shipment of blister rust host plants west of the "Mississippi Valley line."

FINE YIELD FROM WHITE PINE

TWO acres of white pine, near Keene, New Hampshire, were sold three or four years ago, before the war prices, for \$2,000 on the stump. The total stand was 254 cords, which equals 170,000 board feet, or an

average of 85,000 feet per acre. The trees were from 80 to 85 years old; so the growth on each acre was about 1,000 feet per annum and the gross returns about \$12.20 per acre per annum.

THE NATIONAL FOREST RESOURCES OF ALASKA ARE FOR USE

BY JOHN D. GUTHRIE, U. S. FOREST SERVICE

THE National Forests of Alaska are playing an increasingly important role in the development of that rich storehouse of the Nation. Within a few years they will probably play the leading role. The timber resources of the Tongass and Chugach Forests

has changed slightly. It is now claimed that the Forest Service has been forced to sell Government stumpage in Alaska! The facts, easily accessible in many public reports, are that the Forest Service has been offering timber for sale on the Alaskan National Forests ever since

it took over these Forests in 1905. It is selling timber today under practically the same regulations as those of 1905 and each year since. The actual purchasers of National Forest stumpage on the Alaskan Forests during the past fifteen years have known that they could buy Government timber at any time, anywhere. They have also known that the many sawmills in Alaska have been buying and sawing Government timber since 1905. Not only has this lumber supplied the material for local uses, such as canneries, residences, stores, boats, and boxes, but the highest grade of Sitka spruce was shipped out for airplane stock during the war, and Sitka spruce is now being shipped to eastern markets.

The total of 444 million board feet of timber cut from the

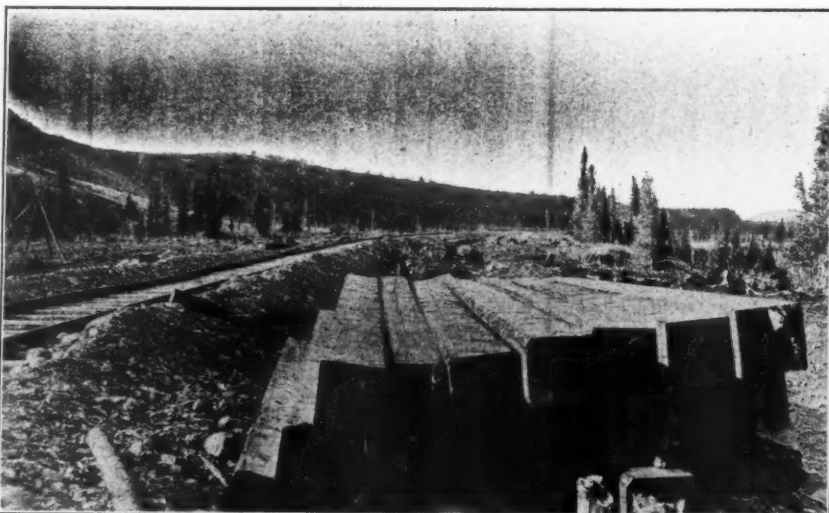
Alaskan National Forests in the past fifteen years covered a large number of individual sales, advertised and offered to the highest bidder as required by Federal

have served local development ever since the administration of these Forests was taken over by the Forest Service in 1905. Now a larger form of development is in prospect. Its effect on the economic upbuilding of the Territory is bound to be of an almost revolutionary character.

It has become a habit to say that Alaska's resources are locked up. The fact that over 444 million board feet of timber has been cut from the Tongass and Chugach Forests during the past fifteen years, while the Forest Service has been in charge, has not prevented a parrot-like chorus of the assertion that Alaskan timber is still "bottled up." Within the past few months, however, and especially since the 100 million foot pulp sale has been consummated by the Forest Service, the plaint



SAW MILL OF THE KETCHIKAN LIGHT AND POWER COMPANY. ALL TIMBER CUT FROM THE TONGASS NATIONAL FOREST



WHITE SPRUCE BRIDGE TIMBERS CUT ALONG RIGHT OF WAY, NEAR HEALY, AT THE END OF STEEL ON THE GOVERNMENT ROAD



HEALY, END OF STEEL ON THE GOVERNMENT RAILROAD, 109 MILES SOUTH OF FAIRBANKS

law. For no single year was the cut less than two million board feet, and the average was nearly 30 million. Two and one-half million board feet were cut in 1905, fifteen million feet in 1909, and 45 million feet in 1914. The peak of 47,900,000 feet was reached in 1918. With one pulp sale of 100 million feet already made, the amount sold from the Alaskan Forests for the present year will undoubtedly run well over 150 million feet. If a second large pulp sale, now pending, is made the total Government stumpage sold from the Alaskan National Forests in 1920 will exceed one billion eight hundred million board feet. Pulp mills are coming to Alaska because of economic conditions, such as the scarcity and high price of pulp material in the eastern centers; not because of any radical changes in Forest Service regulations, and in spite

of the propaganda of misinformation by the anti-conservation press.

Not only has over 444 million board feet of timber been cut from the Alaskan National Forests for commercial purposes during the past fifteen years, but in addition the Chugach National Forest has furnished over 40 million feet of timber, free of charge, to the Alaska Engineering Commission for use in the construction of the Government Railroad.

In addition, any bona fide settler, resident, miner, or prospector may take from the Alaskan National Forests free of charge 10,000 board feet of green or 25 cords of dry timber each year, provided it is needed for personal use and is not sold. A considerable amount of timber is cut under this privilege, and the fact that material for building purposes and wood for fuel can be obtained without cost is of great importance to the local people.

The Chugach Forest is located in the Prince William Sound country, in the vicinity of Seward, Anchorage, Cordova, and Katalla. The construction of the Government railroad is in charge of the Alaska Engineering Commission, headed by a regular army officer. The railroad starts at Seward, on tidewater, and runs north through the Chugach Forest on the Kenai Peninsula to Anchorage, and thence north up the Susitna River. When completed it will have its northern terminus at Fairbanks, some 465 miles from Seward. The Forest Service has granted each year since 1916 a free-use permit to the Alaska Engineering Commission for construction timbers to be cut on the Chugach National Forest. In 1916 the Commission cut 11,363,770 board feet of National Forest timber to be used in railroad construction work. In 1917 over seven million feet was granted free for this purpose. During 1918 and 1919 shortage of labor seriously interfered with construction work on the railroad, but in spite of this over five million feet of free timber was granted each year. Since the close of the fiscal year 1919, more than ten and one-half million board



CONSTRUCTION OF STEEL BRIDGE OVER THE SUSITNA RIVER, 264 MILES NORTH OF ANCHORAGE. PRESENT END OF STEEL ON THE GOVERNMENT RAILROAD

feet of free timber has been furnished for this work.

This timber which the Chugach Forest has contributed free of charge to the Alaska Railroad has consisted not only of sawtimber to be cut at several sawmills operated either by the Commission or by private concerns for the Commission, but of such material as piling, bridge timbers, railroad ties, and telephone poles, covering a wide variety of uses, for docks, snowsheds, section houses, stations, storehouses, quarters for offices and employees, etc.

The latest free permit issued by the Forest Service was made in September,

1920, and covered 2,500,000 board feet of sawtimber, 120,000 railroad ties, and 170 linear feet of piling. These free-use permits are issued in accordance with a Congressional enactment permitting the Forest Service to

grant free National Forest material to the Alaska Engineering Commission for Government works. This free use timber is cut from a strip five miles wide on either side of the right-of-way of the Government railroad. The timber is designated for cutting by forest officers, seed trees being left to reseed the cut-over area. These

permits to the Commission run for one year and contain the usual conditions regarding protection from fire, prevention of waste, and avoidance of unnecessary damage to trees left standing.

The National Forests of Alaska have thus for the past fifteen



SHIP CREEK RANGER STATION, ANCHORAGE, ALASKA, ON THE CHUGACH NATIONAL FOREST

years been helping in the local development of Alaska by furnishing a supply of lumber for its industries and for Government use in building a railroad which is going to mean greater things for that country.



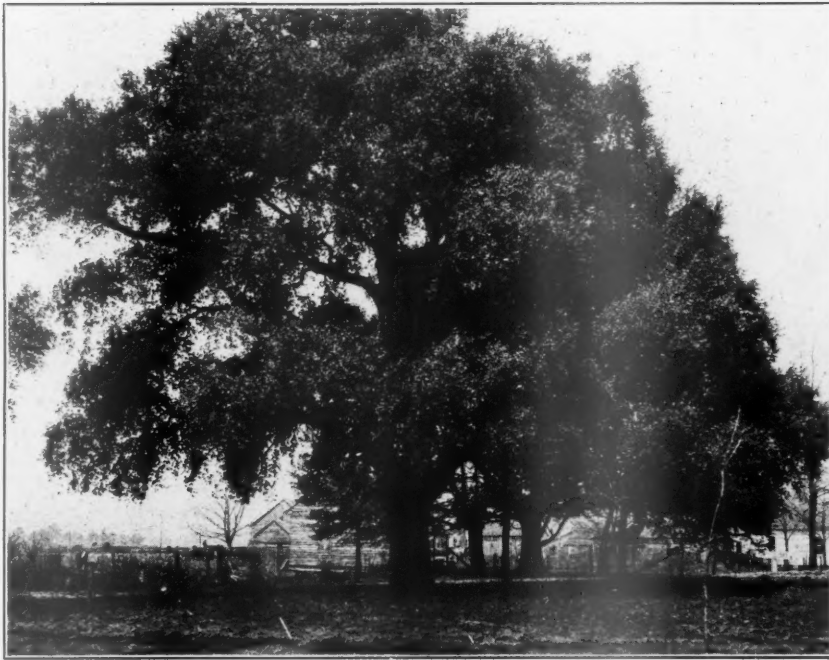
DEDICATION OF THE SCOUT RESERVATION

The Boy Scouts of the District of Columbia have dedicated the Woodrow Wilson Boy Scout Reservation, a forty-one acre tract at Burnt Mills, Maryland. The tract is the gift of Robert S. Brookings to the 2,500 Boy Scouts of the District. There are streams, wooded hills and a fine swimming hole, as well as spaces for athletic events. After the raising of the colors, the Scouts repeated the allegiance to the Flag, the Scout oath and the Scout laws. (Photograph by Underwood and Underwood.)

AMERICAN GROWN CORK

BY GEORGE N. LAMB

STANDING on the edge of a cotton field a half mile north of Daphne Station, west of Cordele, Georgia, is undoubtedly the largest specimen of cork oak (*Quercus suber*) in America. The tree is over one hundred years old and tradition says that the acorn from which it grew was brought to this country from Spain by a Southern planter. At the



THIS IS THE LARGE CORK OAK GROWING ON THE EDGE OF A COTTON FIELD AT DAPHNE, GEORGIA. IT IS PROBABLY SEVENTY-FIVE TO ONE HUNDRED YEARS OLD AND IS A REMARKABLE AND BEAUTIFUL EXAMPLE OF THE LARGE PROPORTIONS THE TREE ATTAINS

time it was secured Spain prohibited the export of cork oak acorns in order to protect their monopoly on the cork industry.

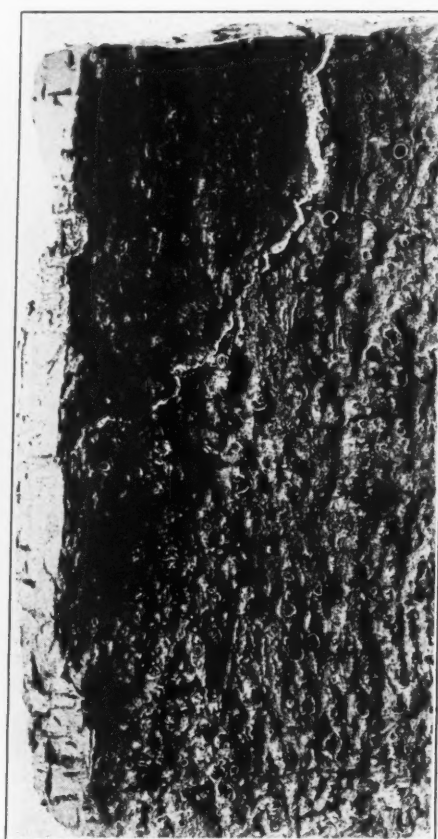
The gigantic size of this exotic is attested by the fact that it is $45\frac{1}{2}$ inches in diameter one foot from the ground. It has a height of 60 feet and a spread of 60 feet one way and 70 feet the other. The tree forks into four



THIS IS A CLOSE-UP OF THE BRANCHING OF THE OLD CORK GIANT, AND SHOWS CLEARLY THE CORKY BARK OF THE FIRST LIMBS



OUTER SURFACE OF HEAVY CORK BARK



INNER SURFACE OF HEAVY CORK BARK

branches at eight feet from the ground. In general appearance at a distance it might be a symmetrical, spreading live oak, but on coming closer its heavy limbed appearance is striking. The thick corky bark extending out to the small branches causes this effect.

The bark on this specimen, never having been harvested regularly, is very thick and coarse, except in one place on the trunk where a portion had been removed by accident or otherwise. At this point the new bark was smooth and of excellent quality. The rough bark was from 12 to 15 years old and 2 to 2¾ inches thick on the main trunk.

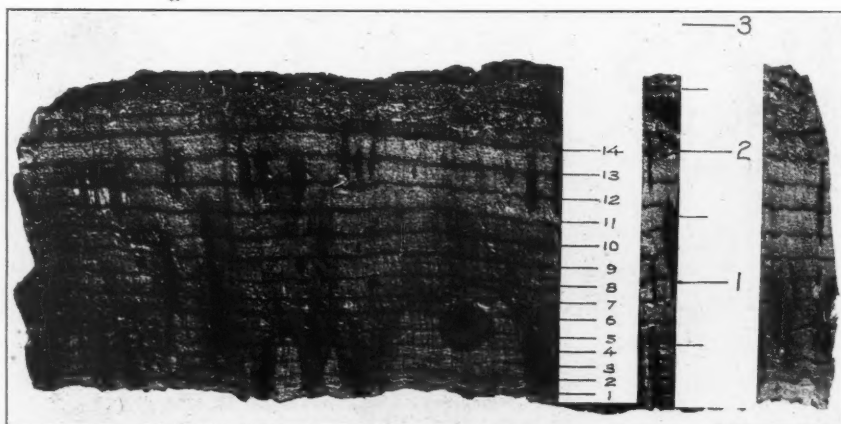
The writer has also seen smaller specimens of cork oaks at Byromville, Georgia; Atlanta, Georgia, and Columbia, South Carolina, growing so vigorously that there seems to be no doubt that the tree will thrive in the longleaf pine section of the Atlantic and Gulf States. If cork oak could be substituted for the "scrub" oak that is now coming in on the cut-over longleaf pine lands, a valuable economic resource

would be available for future generations. The combination of longleaf pine and cork oak would bring together two trees which furnish excellent wood and also yield a revenue from other sources while they are coming to maturity. Properly handled the pine will yield quantities of valuable turpentine and rosin in its early life and then make desirable lumber when mature. The cork oak yields a crop of cork every few years and finally produces a crop of excellent wood.

One of the greatest causes of damage in this region is fire although longleaf pine is particularly resistant. Cork oak should be able to survive as well or better than pine as the thick corky bark would protect the growing tissue from the heat and is in itself very non-combustible.

Should cork oak ever be established in the longleaf pine region it would bring together not only two trees furnishing valuable wood and valuable by-products, but would also bring together the two most singular and striking species appearing anywhere in the forests of the world.

This remarkable specimen of cork oak at Daphne has been nominated for a place in the Hall of Fame for Trees being compiled by the American Forestry Association at Washington, D. C.



AN INTERESTING PICTURE OF A CROSS SECTION OF THE ROUGH BARK FROM THE DAPHNE CORK OAK. THESE SPECIMENS WERE COLLECTED AND PHOTOGRAPHED BY THE WRITER

FOR A NATIONAL FORESTRY BILL

THE National Forest Program Bill has been introduced in the Senate and in the House. It is expected that hearings will be held before committees of the Senate and House early in the year for the purpose of presenting arguments in favor of the bill—and the prospects for its passage are very bright. The fact that practically every interest concerned in forestry is in favor of the bill in itself alone almost assures its success as Congress can not well ignore a very general demand for the adoption of such vitally important, sane and practical legislation.

The bill has now been endorsed by the following:

American Forestry Association.

United States Forest Service.

Western Forestry and Conservation Association.

Society for the Protection of New Hampshire Forests.

National Lumber Manufacturers' Association.

National Wholesale Lumber Dealers' Association.

American Paper and Pulp Association.

American Newspaper Publishers' Association.

Southern Pine Association.

Association of Wood-Using Industries.

National Forest Fire Protection Committee.

The California White and Sugar Pine Association.

Empire State Forest Products Association.

New York City Federation of Women's Clubs, and the forestry departments of seventeen states.

The Chamber of Commerce of the United States is asking its members to take a referendum on the subject of endorsing the bill and it is expected that the business interests of the country will unanimously call upon Congress to pass the bill.

A committee of representatives of the organizations which have endorsed the bill has been formed. It is called the National Forestry Program Committee, and R. S. Kellogg, of New York, is the chairman.

Every member of the American Forestry Association is requested to personally urge the Senators of their State and the Representatives from their districts to give unqualified support to the bill.

Of the need of the bill Colonel W. B. Greeley, United States Forester, says in his annual report:

"In the report of the Forester for the fiscal year 1919 my predecessor, Colonel Henry S. Graves, set forth the urgency of a national forestry policy. During the major part of the fiscal year covered by this report the movement gathered headway under his leadership. Since his resignation, on April 15, 1920, the movement has continued along the lines laid down by him, and the program which he formulated has been further developed.

"This program is based on the conviction that the problem of halting forest devastation is fundamentally a national, not a local, problem, and must be faced and handled as such. At the same time it is felt that the speediest, surest, and most equitable action can be secured through dependence on the police powers of the States for the enforcement of such reasonable requirements as

should be made of private owners and on the State governments for providing organized protection of private lands against fire. Because the problem itself is essentially national—that is, one affecting the public welfare of the entire country and requiring to be attacked as a whole, not piecemeal—both Federal leadership and a large measure of Federal aid are obligatory. It should be obligatory upon private owners to apply the safeguards necessary to prevent devastation. There is a practical unanimity of agreement that the first and most essential step is nation-wide protection from forest fires, applicable to all classes of forest land and borne jointly by the landowner and the public.

"When the movement was inaugurated the chief effort was directed toward laying the need for action before those having first-hand knowledge of forest conditions and most directly concerned in forest industries. Conferences were held in various parts of the country with representatives of the lumber, paper, and other forest-using industries, and with State officers having to do with forest matters. The widest discussion of the situation and the precise measures needed was invited. Interest in the subject developed rapidly. Organizations of the various industries dependent on forests for raw material began to canvass the situation, in many cases to appoint forestry committees and to formulate programs of their own. It was chiefly along these lines that the movement advanced during the year, though there was not lacking evidence of a decided awakening of interest on the part of the public generally. To this the acute shortage and skyrocketing prices of lumber and newsprint, which marked the year, undoubtedly contributed.

"The crucial character of the forest situation of the country was made more clear than ever before by the results of a study made in the latter part of the year by the Forest Service, in response to Senate resolution 311. The results of this study were embodied in a report entitled "Timber Depletion, Lumber Prices, Lumber Exports, and Concentration of Timber Ownership," and were submitted to the Senate on June 1. It was found that over two-thirds of the original forests of the United States have been culled, cut-over, or burnt, and three-fifths of their merchantable timber is gone. The country is taking about 26,000,000,000 cubic feet of wood annually from its forests and is growing but 6,000,000,000 feet. We are cutting timber of every class, even trees too small for the sawmill, much faster than they are being replaced in our forests.

"There are still large quantities of timber in the United States, but they are not in the right place. Sixty-one per cent of what is left lies west of the Great plains, far from the bulk of our population, agriculture, and manufactures. The exhaustion of one forested region after another in the Eastern States has been reflected in rising transportation costs, in shortages of supply resulting from the overloading of transport facilities, and in

a narrowing field of competition between regional groups of sawmills. The distance between the average sawmill and the average home builder is steadily increasing; and we shall soon be dependent for the bulk of our construction lumber upon the forests of the Pacific Coast. These conditions have had a vital bearing upon the high cost of lumber, which, during the year, reached a prohibitive figure for many uses and checked the building of homes which is so urgently needed.

"We have used up our forests without growing new ones. At the bottom of the whole problem is idle forest land. The United States contains 326,000,000 acres of cut-over or denuded forests containing no saw timber; 81,000,000 acres of this amount have been completely devastated by forest fires and methods of cutting which

destroy or prevent new timber growth. The area of idle or largely idle land is being increased by from 3,000,000 to 4,000,000 acres annually as the cutting and burning of forests continue. We are short of growing forests.

"To stop the devastation of our remaining forests and put our idle forest lands at work the first step must be the enactment of a Federal law whose two chief provisions are (1) a comprehensive plan of Federal co-operation with the States in fire prevention and the development of forestry practice, and (2) extension of the National Forests through purchases along the line initiated by the Weeks Act, through the inclusion of other timberlands now in Federal ownership, and through exchange.

FORESTRY IN CONNECTICUT

SOME startling facts regarding the present forest situation in Connecticut were brought out at a special meeting of the Connecticut Forestry Association at Hartford on November 27. This was the largest forestry meeting ever held in the State and was attended by many prominent lumbermen, landowners, and foresters. The Committee on Connecticut Timber Supply reported that the State now consumes annually 305 board feet of saw timber per capita as against a production of 51 board feet. The production of lumber has decreased by 50 per cent from 1910 to 1918, and now amounts to less than 17 per cent of the lumber consumption, in spite of a falling off of 35 per cent in this consumption during the last eight years.

At the present rate of cutting the Committee estimates that the existing hardwood supplies will last but fifteen years and the white pine but twelve years. So far as the hardwoods are concerned, the crisis naturally arising from their destruction by cutting is aggravated by the ravages of the chestnut blight. This has destroyed the most valuable and rapidly growing hardwood species in the State, which has been the mainstay of the farmers who own the vast bulk of the forest lands. With the disappearance of the chestnut many of these can no longer afford to hold their lands for timber growth.

This situation means that Connecticut is facing in the comparatively near future a timber famine which will result in the elimination of the bulk of its sawmills and in the disappearance of many local wood-using industries. The resulting high prices for lumber will delay or prevent many needed improvements. Immense sums will have to be paid for freight on lumber brought from the Pacific Coast. State and local revenues will be reduced because of the low taxable value of nonproducing forest lands and the closing of industries dependent on the forest for their raw material.

This gloomy outlook exists in spite of the fact that the forest area has increased from 29 per cent of the total area of the State in 1903 to 46 per cent, or nearly 1,500,000 acres, at present. The State already pays \$3,000,000 annually in freight bills for the transportation

of lumber from other forested regions, an amount sufficient to replant each year one-eighth of the entire area of forest land in the State. That this expenditure constitutes an unnecessary drain upon the resources of the State is shown by the fact that under proper management Connecticut could produce an amount of saw timber equal to her present consumption of 375,000,000 board feet a year on 86 per cent of the present forest area. It is up to the people of the State to say whether or not they wish to adopt measures which will make this possible, or to follow the present course of forest destruction and general impoverishment.

The Connecticut Forestry Association in the resolutions adopted at its recent meeting pointed out that it is of the utmost importance that these facts be brought to the attention of the public at large and that a progressive program of forestry be undertaken by the State. Among the specific activities advocated by the Association was the giving by the farm bureaus in the several counties to the farmers in the State, such information and advice as to growth, management, and marketing of forest crops as they now give with respect to annual crops. This would undoubtedly be a most important and effective step in the attempt to increase the production of timber on Connecticut's forest lands, most of which are in the hands of farmers.

The Association also approved of the purchase by the State during the next ten years of at least 100,000 acres of forest land to be organized and administered as State Forests for the continuous production of the timber essential to the State's industries, and urged an appropriation of \$50,000 for this purpose by the General Assembly of 1921. The Committee on State Forests further suggested that this expenditure should be in the hands of the State Park Board and that this Board should appoint the State Forester. The need for a general reform in the present method by which an annual tax is imposed on growing timber was recognized by the Association, which proposed that standing timber should be exempted from annual taxation but should pay a products tax at the time it is cut. This products tax,

according to the recommendations of the Committee on Forest Taxation, would be collected from the person who cuts the timber, and operators would be required to take out licenses. Exemptions are proposed for material to be used for domestic purposes, including buildings,

and on any amount less than \$50 in value. This is a forward-looking program, which should receive the hearty support of the people generally in Connecticut as a step toward increasing the prosperity of the State through the rational handling of its forest resources.

STATE FORESTERS' MEETING

A WELL attended meeting of State Foresters from seventeen different States was held at Harrisburg, Pennsylvania, on December 8 and 9, for a general discussion of forest problems of mutual interest to the various State forest organizations. Governor Sproul, by whom the conference was called, opened the meeting with an address emphasizing strongly the need for a comprehensive national forest policy to check the devastation of our rapidly dwindling forests. Governor B. M. Olcott, of Oregon, was elected chairman of the conference and presided over its two days' session.

The two most important papers presented at the conference were those by Colonel W. B. Greeley, Chief Forester, on "The Nation and the National Forest Policy," and by Gifford Pinchot, Commissioner of Forestry for Pennsylvania, on "The States and the National Forest Policy." Colonel Greeley urged the adoption of a forest policy which would leave the actual control of fire and of cutting operations in the hands of the individual States under the leadership and with the financial and technical assistance of the Federal Government. He advanced the idea that forest lands are public utilities and held that the States should be encouraged to go just as far as they will in reforestation, and that any State inclined to impose restrictions on their handling should be given a clear field. Mr. Pinchot, on the other hand, favored Federal as opposed to State control of cutting, since in his judgment Federal control is the only form that can be obtained, and if obtained can be effectually enforced. Both Colonel Greeley and Mr. Pinchot were

in agreement that forest fire protection should be handled by the States with the co-operation and assistance of the Federal Government.

Other papers covered a wide variety of subjects, including the timber needs and supply of the various forest regions of the country, the problem of State-wide forest fire protection, the organization of State forest work and State forests, timber surveys, and private forestry. J. H. Wallace, Commissioner of Conservation in Alabama, urged immediate action for the creation of a Federal Department of Conservation, to include natural resources. He declared that the conservation activities which are now scattered through half a dozen different Departments should be co-ordinated, and that this would be a real aid to the States in the development of their policies.

One of the interesting developments of the meeting was the establishment of an Association of State Foresters to bring together the forest officials of the several States for the discussion of problems of mutual interest and to promote co-operation in forest matters between the various States as well as between the Federal Government and the States. W. T. Cox, of Minnesota, was elected president of the association; F. W. Besley, of Maryland, vice-president, and R. C. Jones, of Virginia, secretary and treasurer. These officers, with Gifford Pinchot, of Pennsylvania, and C. R. Pettis, of New York, constitute the executive committee. It is anticipated that the new association will be productive of much good by establishing close relations between the various State forest officials.

STATE FORESTERS DEMAND LEGISLATION

AS a result of a conference of State Forestry officials held at Atlantic City, November 12 to 13, 1920, for the purpose of considering the question of National Forestry legislation, and attended by officials from sixteen of the thirty-four State Forestry Departments, representatives of the Forestry Departments in the following States, fully endorsed the recommendations of the United States Forest Service, relating to co-operation with States in fire protection and forest renewal, as embodied in the report on Senate Resolution No. 311, known as the "Capper Report:" Alabama, Connecticut, Illinois, Iowa, Kansas, Louisiana, Maine, Maryland, Massachusetts,

Michigan, Montana, New Jersey, New York, Ohio, Oregon, Virginia and West Virginia.

They also urged upon Congress the enactment of the legislation necessary to make those recommendations effective, accompanied by suitable annual appropriations, which, for the fiscal year ending June 30, 1922, should not be less than one million dollars (\$1,000,000), to be expended by the Secretary of Agriculture in co-operation with the several States, for forest fire prevention and control, forest investigations, and timber production, including forest planting.

ACCORDING to figures of the Forestry Department of Canada two-thirds of Canada's forests have been destroyed by fire the past 75 years. But Canada still has 1,900,000 square miles of wonderful forest land.

THE lumber required to make boxes for Washington's 1919 crop of apples, says the Reclamation Service, was sufficient in quantity to build 9,660 average country houses, each sheltering a family of five persons.

FOREST GUIDES DEPARTMENT

SOLAN L. PARKES, EDITOR

The Forest Guides Department will be a monthly feature of the "American Forestry" Magazine. It will furnish information and instruction to the Forest Guides about our forests, woodlands and trees, and everything connected with them. The editor will conduct a Question Box, and any Forest Guide may ask and will receive an answer to any question about the great outdoors. Scoutmasters will read the Forest Guides Department at meetings of the Forest Guides, and will assist the editor by furnishing him with information about the activities of the Guides. It is expected that this department will soon be read by every Boy Scout organization in the country, while other sections of the magazine will give them equally valuable information about various details of the forests and forest life.

THIS Forest Guides Department is made a part of the "American Forestry" Magazine with the object each month of teaching Forest Guides about the trees, the wild flowers, birds, and wild life of the forest, in order that you may know the vast benefits and pleasure you derive on your hikes or in your camps. We want to teach you that trees represent to us more than the wood and the lumber that we get from them. We want to teach you that the birds are here for a purpose, instead of just flying through the air. We want to teach you, besides, that the wild flowers are also performing a duty for us, and

that every animal of the forest is working in some way or other for our benefit. We want to teach you to know the trees, without becoming a forester, the wild flowers, without becoming a botanist, the birds, without becoming an ornithologist, the insects, without becoming an entomologist, and so on.

IN this department, it will interest us less as to just exactly how many board feet of sawed lumber there may be in any one given tree, and much more to know what benefits we derive from the standing tree.

It will interest us more to know how birds live, and on what they feed, and how to attract them, and also to know them by their song and color, than it will interest us, perhaps, to know their structural form.

We will lay greater stress in telling you of the great benefits we derive from the wild flowers as we leave them on their plants or shrubs, than we may care to teach you about

plucking them to study their form, or have them adorn your person for but a little while, and then cast away.

We will teach you about the great loss we suffer when forest fires sweep through our forests; how the forest floor conserves for us our water supply, on which our very life is depend-

THE FOREST GUIDES DEPARTMENT

The Forest Guides, originated, organized and under the direction of Solan L. Parkes, as Chief Forest Guide for the State of Pennsylvania, in the belief that our forests, together with their wild life and plant life, should be protected and conserved for our common good, pledge themselves to "do nothing wilfully or carelessly to injure any forest tree, wild plant, bird or harmless animal, and to do all in their power to protect and conserve the same, to urge others to do likewise, and to prevent and extinguish forest fires."

Believing that this Forest Guide movement, so ably organized and directed by Mr. Parkes, needs and deserves support and stimulation, The American Forestry Association has made its magazine, "American Forestry," the official organ of the Forest Guides. It is confidently believed that other States will soon follow Pennsylvania's aggressive lead in this field and that the Forest Guides, from a present enrollment of 6,000 in Pennsylvania, will soon be numbered in the tens of thousands throughout the land.

ent; how forest fires destroy the tree sheds, that otherwise spring to life and give to those that follow us a crop of timber on which to draw for their needs.

We will teach you that if there were no standing trees or shrubs, that the birds would not be with us, for there they build their nests to rear their young, while they fly to neighboring fields

The enrollment of Forest Guides among the Boy Scouts of America is one of the most valuable of recent contributions to the progress of forestry and fire protection in the United States. It will bring to bear the activity and enthusiasm of thousands of capable boys in the work of preventing and extinguishing forest fires, and will be of enormous value also in the creation of public sentiment against them.

The Forest Guide plan originated in Pennsylvania. It was devised by Solan L. Parkes, Scout Executive of Reading, to whom the full credit for originating the idea is directly due. Already in a few weeks nearly 6,000 Pennsylvania Boy Scouts are enrolled as Forest Guides. I hope the movement may spread to every other forested State.—Gifford Pinchot.

and devour the insects that would, otherwise, destroy the farmer's crops.

We will teach you that while we go on learning of this work in conservation and preservation in such language that all can understand, the realization will come to us, and stay by us, that all things were placed in the world by a Supreme Being.

* * * * *

NEXT month, we will have an article on the identification of trees in winter, by J. S. Illick, of the Forestry Department of Pennsylvania. This will be very interesting and instructive, and will give you a great deal of pleasure on your hikes, where, by bark and bud, you will learn to know the trees in winter.

* * * * *

WE will learn to do by doing, and with the first appearance of this department, I want each Forest Guide to do a good Scout turn.

Somewhere near your home, when the snow covers the ground, perhaps many feet deep, there will be birds, unable to find anything to eat. Each Forest Guide should establish a feeding station, and provide food, during the winter months, for our feathered friends. You will be surprised, after a little while, how tame the birds will become, and the excellent opportunity you will have to study the different kinds.

* * * * *

TO help you more, we will establish a question box, and answer any question which Forest Guides may ask in order to help solve the problems which confront them.



SOLAN L. PARKES, CHIEF FOREST GUIDE FOR THE STATE OF PENNSYLVANIA AND EDITOR OF THE FOREST GUIDE DEPARTMENT OF THE AMERICAN FORESTRY MAGAZINE

Boy Scouts not living in Pennsylvania, who would like to become Forest Guides, are requested to write me.

Scoutmasters desiring articles on special subjects, we will be glad to hear from you.

All mail for the Forest Guides Department should be addressed to Solan L. Parkes, Chief Forest Guide, Box No. 9, Reading, Pennsylvania.

AMERICAN BEARS

BY R. W. SHUFELDT

(PHOTOGRAPHS BY THE AUTHOR AND OTHERS)

THE appearance as well as many of the habits of an ordinary bear are known to most people, and this has been the case for ages and generations; so that it is not at all surprising that the world's literature on bears, together with the pictorial illustrations of them, is enough to make a library of itself. There is also a large myth-lore about bears, both in adult and in juvenile history, and hundreds of times they have been the subjects for the sculptor's chisel or otherwise reproduced in solid form.

No bears occur in either African or Australian regions, and only one species in the Neotropical region.

Most bears are vegetable feeders, though the Grizzly and Polar bears are almost exclusively flesh-eaters; it is said, however, that the latter will eat grass in the summer time. Comparatively speaking, they are all animals of considerable size, differing not a little in their habits and modes of life. In addition to the Grizzly and Polar bears, the best known bears of the world are the common Brown bear of the Old World (Fig. 1); the American Black bear and its varieties; the Spectacled bear of the Peruvian Andes; the Sloth Honey bear, and the Malay or Sun bear; and there may or may not be one or more varieties or subspecies of any these. Bears seem to have been derived from some extinct dog-like ancestor; though fossil remains of bears have been discovered that belong to the typical bear family. The well-known extinct Cave bear of Europe belongs in the last-named group, and was a species of immense bulk.

After a fashion, the majority of bears can manage to climb trees, and I once saw a Black bear climb to the top of a telegraph pole; in descending they come down hind feet first, and it is said that the adult Grizzly is unable to climb.

Most flesh-eating bears are very ferocious in disposition and extremely dangerous in attacks on their enemies; however, the true vegetable feeders are very often, even in nature, gentle and harmless. I once heard a story of

a Brown bear in the wilds of Norway that overtook a child that had gathered a basketful of berries, of which fruit the animal is very fond, never molesting the little peasant girl in the least; she thought all the time that it was a big dog she had to deal with.

The small black bear, with the white crescent on its chest, so frequently seen in zoological gardens in this country, is the Malayan bear, which is a species easily tamed. In the Honey bear of India two of the upper

incisor teeth are lacking, and its lips are very extensible. The soles of the feet in the Polar bear are more or less hairy, only the small pads being naked, and this allows these animals to walk on the ice without slipping. For many years past, the pelts of some of the species—notably the Black bear of this country—have played an important part in the fur trade, thousands having been shipped to Europe every twelvemonth; but the skins of some bears are quite valueless as furs. It is the Brown bear of Europe that can be so easily tamed and taught to stand upright on its hind legs and dance to music.

There is much yet to be learned about the bears of the United States before knowledge of their habits, ranges, and anatomy will be complete. This is the more remarkable from the



A BROWN BEAR SCENTING GAME

Figure 1. Of all the existing species of bears, this European Brown Bear has perhaps been known as long as any of them; it is noticed in works many centuries old. This is the bear that can be so easily tamed and taught to stand on the hind legs and dance.

fact that naturalists, hunters, and others of this country have written about them, published pictures of them, and talked about them for wellnigh three centuries. At as recent a date as 1884, Prof. F. W. True, of the United States National Museum, published in the Proceedings of that institution a "Provisional List of the Mammals of North and Central America and the West Indies," in which was supposed to appear the names of all bears known to science at that time in the vast region named. In that list only four species were given and no subspecies. These four were the Black bear, the Grizzly bear, the Barren Ground bear, and the White or Polar bear. As for the ranges of these animals, even less than a quarter of a century ago they were of so indefinite a

nature as to be particularly valueless. No attempt will be made here to list the many North American bears that have been described by our naturalists, as this would carry us far beyond our space limits. However, one writer on the subject claims to find no fewer than forty or more different kinds of bears—a statement that saner naturalists take with a very large pinch of salt.

No bear in all the world is more interesting in its habits than the Polar or White bear of the Arctic regions, also widely known as the Ice bear. This species has an individuality that no other representative of the bear family possesses; and its history, as it has been recorded by man, extends back over more than a century. So distinctive are the characters of this great, white, hairy-footed, black-nosed bear, that apparently no zoologist has ever made any attempt to record more than the one species of the animal—every writer on the subject considering the ice bears of the north, on the two Hemispheres, to be identical. In North America they have been reported as far south as northern Labrador; while in the realms of its ice bound home it ranges everywhere. This is not at all surprising, as this bear, with its love

of roaming and great, fur-padded feet, can move over the most slippery ice almost anywhere and that at a very good speed. Moreover, it is as fine a swimmer as a seal, and behaves, in the ice-cold seas of the north, with as much unconcern as though it had been born in that element. It has been known to drift for miles upon a floating iceberg, and this evidently for pleasure and convenience, rather than from necessity, as a number of Arctic explorers have reported having seen Polar bears, hale and hearty, swimming in the open ocean all the way from forty to eighty miles from any land

or other landing-place. As for the size of a big male of this species, this is, even at the most recent time, a matter of dispute by observers, and the total length of various specimens has been given all the way from seven feet to thirteen, with weights to correspond. It is not at all unusual to find these immense bears in menageries and zoological gardens, both in this country and abroad; hunters in the Arctic regions have often captured the cubs after killing the old she-bear, and these invariably command a good price, selling readily to dealers in wild

animals. In confinement the Polar bears will feed on many kinds of vegetables and fruit, and they have been known to thrive on wheat bread alone. Where they are more or less numerous, Arctic explorers have found them to be a downright nuisance, as they steal provisions however carefully concealed. Normally, though, this bear is a typical flesh-eater, and prefers seals, fish, and other kinds of flesh above everything else, when chance throws it in his way. The meat of the ice bear does not agree with man, as a rule, though dogs will thrive on it well, and in that way it has often been a boon to the explorer in the Polar regions.

A writer says in *Animal Life* that

"when the first discoverers went to the Arctic Seas, dressed in thick clothes and skins, the Polar bears took them for seal. On Bear Island, below Spitzbergen, a Dutch sailor sat down on the snow to rest. A bear walked up behind him, and seized and crushed his head, evidently not in the least aware what kind of animal it had got hold of." That is a pretty good story; but we must believe that Bruin, on that occasion, knew pretty well that he had not tackled either a seal or a walrus—much less a fish or a clutch of gull's eggs. In hunting the seal the Polar bear is at his best, and he commands



THE POLAR OR WHITE BEAR

Figure 2. This group of Polar Bears represents a female with her two young; the latter are about to feast upon a dead harbor seal, captured for them by their mother. These bears are so clever that when hunting seals they conceal the black tips of their noses, the only part of them that is not snow white. This is a group in the United States National Museum, photographed by the Author.

a score of ways to outwit his prey. Making no noise, he will stalk him over the ice, and adroitly pounce on him at the finish. He will watch a seal-hole as a cat will patiently await the coming out of a mouse; he will hunt him leisurely along the edge of the ice-floes; then, if the seal happens to be up on the ice and awake—and the bear hungry and believes himself discovered—he will, in a careless sort of way, slide into the water, dive, and then swim around to the point where the seal rests, seizing him before he has a chance to escape. Several Arctic explorers state that they have seen this bear



ONLY THE BEAR CUBS CLIMB TREES

Figure 3. It is remarkable to note the agility with which a cub will ascend a tree; but still more interesting to note that hunters agree that full grown bears do not climb the trees.

capture fish in the water, diving for them just as a seal does—which is not hard to believe when one has observed how much the animal is at home in water, in which he cuts almost as many capers as an otter.

From Nordenskjöld's "Voyage of the Vega" we learn that "when the Polar bear observes a man, he commonly approaches him as a possible prey with supple movements and a hundred zigzag bends, in order to conceal the direction he means to take, and to prevent the man from feeling frightened. During this approach, he often climbs up onto blocks of ice, or raises himself on his hind legs, in order to get a more extensive view. If he thinks he has to do with a seal, he creeps or trails himself forward on the ice, and is then said to conceal with his forepaws the only part of his body that contrasts with the white color of the snow—his large black nose. If the man keeps quite still, the bear comes in this way so near that it can be shot at the distance of two gun-lengths, or killed with a lance—which the hunters consider safer." Should this bear grapple with a man, it rarely or never resorts to hugging his intended victim as our Black bear does, instead he uses his short, sharp claws, and bites like a tiger.

It is now well known that it is only the females of

the Polar bears that hibernate during the months of the long Arctic winter. The males ramble around during the entire year, fitted, as they are, to withstand the most severe cold. They never make any attempt to escape it, either by migrating farther south or by hibernation.

Years ago the Esquimaux reported to Captain Lyon that "at the commencement of winter, the she-bears are very fat and always solitary. When a heavy fall of snow sets in, the animal seeks some hollow place in which she can lie down, and then remains quiet while the snow covers her. Sometimes she will wait until a quantity of snow has fallen, and then digs herself a cave; at all events it seems necessary that she should be covered by and lie in the snow. She now goes to sleep, and does not wake until the spring sun is pretty high, when she brings forth two cubs. The cave by this time has become much larger from the effect of the animal's warmth and breath, so that the cubs have room enough to move; and they acquire considerable strength by continually



A BLACK BEAR FORAGING

Figure 4. When not hibernating, bears get a very large amount of physical exercise in the routine of their daily life, and it is truly extraordinary how much ground one will cover in the course of a day.

suckling. The dam at length becomes so thin and weak that it is with great difficulty she extricates herself when the sun is powerful enough to throw a strong glare through the snow which roofs the den. The natives, by means of dogs, which scent them through the snow, and begin scratching and howling very eagerly, find and kill the bears during their confinement. As it would be unsafe to make a large opening, a long trench, of sufficient width to enable a man to look down and see where the bear's head lies, is cut; he then thrusts in his spear. The old one being killed, the hole is broken open, and the young cubs may be taken out by hand, as, having tasted no blood and never been at liberty, they are harmless

and quiet." Some writers assert that the cubs are born during the very early part of the winter, and remain in the snow-den until May, when all three animals come forth, and that at a time of the year when food is abundant. Surely the mother needs it then; and she also has the task of teaching her cubs how to provide for themselves.

The superb valor that a she-bear will display when defending her cubs is vouched for by those who have witnessed such scenes. Out of a large number of such stories, let us select the following, told by Scoresby in his *Voyage to Greenland*. He narrates that "early in the morning, the man at the mast-head gave notice that three bears were making their way very fast over the ice, and directing their course toward the ship. They had probably been invited by the blubber of a sea-horse which the men had set on fire, and which was burning on the

portion for herself. As she was carrying away the last piece, the men leveled their muskets at the cubs and shot them both dead; in her retreat they wounded the dam, but not mortally.

"It would have drawn tears of pity from any but unfeeling minds to have marked the affectionate concern manifested by this poor beast in the last moments of her expiring young. Though she was sorely wounded, and could but just crawl to the place where they lay, she carried the lump of flesh she had fetched away, as she



READY FOR A NOONDAY NAP

Figure 5. In the forest, Black Bears are extremely cautious as to where they take a mid-day nap; this cut exhibits their usual procedure under such circumstances. If they do not sleep with one eye open they have both nostrils alert, and their keen sense of smell warns them of approaching danger.

ice at the time of their approach. They proved to be a she-bear and her two cubs; but the cubs were nearly as large as the dam. They ran eagerly to the fire, and drew out from the flames part of the flesh of the sea-horse which remained unconsumed, and ate it. The crew from the ship threw great pieces of the flesh, which they had still left, upon the ice, which the old bear carried away singly, laid every piece before her cubs, and, dividing them, gave each a share, reserving but a small



Photograph by Mr. H. K. Vreeland.

A MONSTER GRIZZLY

Figure 6. This picture shows a big Grizzly at home in the forests of northwestern Wyoming. Strong shadows of the trees cross the trail behind him, and his own deep shadow obscures his right foreleg and its enormous claws. These latter, however, are well shown on the feet.

had carried the others, tore it into pieces, and laid it down before them; and when she saw they refused to eat, she laid her paws first upon one and then on the other, and endeavored to raise them up. All this while it was piteous to hear her moan. When she found she could not stir them, she went off, and when at some distance looked back and moaned; and that not availing to entice them away, she returned, and smelling around them, began to lick their wounds. She went off a second time as before; and having crawled a few paces, looked again behind her, and for some time stood moaning. But, still her cubs not rising to follow her, she returned to them again, and with signs of inexpressible fondness, went round first one and then the other, pawing them and moaning. Finding at last that they were cold and lifeless, she raised her head toward the ship and growled her resentment against the murderers, which they returned with a volley of musket-balls. She fell between her cubs, and died licking their wounds."

And we boast of the humanity of man! The word

humanity is often only another name for the most unmitigated cruelty. As long as these men had slain this bear's cubs—the least they could have done was to have shot her immediately afterwards, and saved her all the unnecessary pain and mental distress she subsequently suffered.

This brief account is by no means all that could be written about this fine species of bear—how it attacks the young whales, for example, also the young and old walrus and other animals; further, how much they enjoy flattening themselves out on the ice, with fore and hind limbs stretched to their utmost.

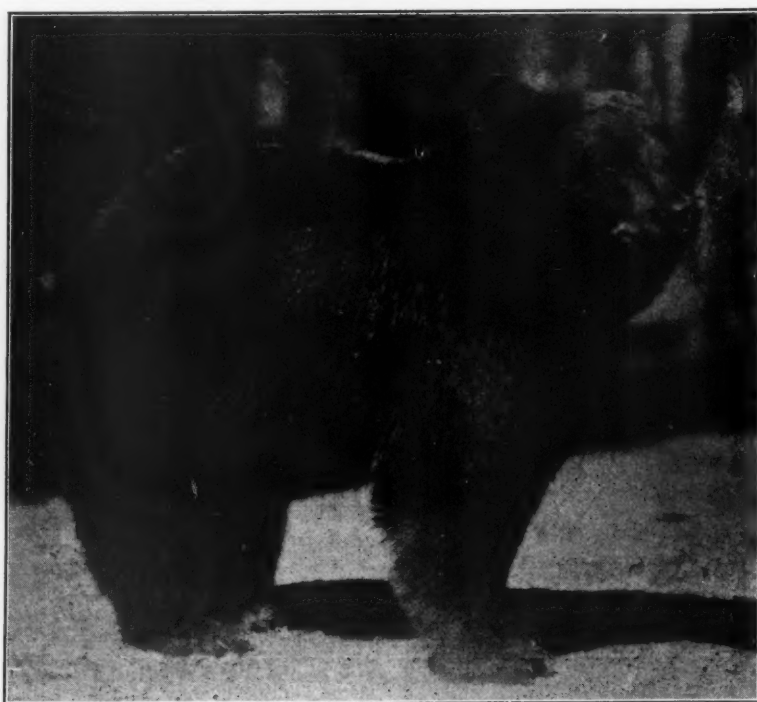
There is not very much literature on the Kadiak bear, comparatively speaking. Stone and Cram, in their "American Animals," give us three fine reproductions of photographs of it, taken by Mr. A. R. Dugmore, but refer to it only in three lines of type. Doubtless it has many of the habits of its kind; and inasmuch as it has not been rendered fearful of man, it is likely that it is a more or less dangerous antagonist to encounter in its native wilds.

The life histories of the Grizzly bears teem with interest. All true hunters of big game delight in reading a good bear story—if such a story describes an exciting grizzly hunt, so much the better. Although descriptions of such hunts have been published by the hundreds, the most hazy notions exist in many quarters in regard to these animals—their size and weight, some of their habits, their definite distribution, the distinction between them and other large American bears, and even the alleged specific and subspecific differences of the various grizzlies themselves. For example, Stone and Cram state in their "American Animals" that the Grizzly is the largest bear in the world, while on another page of the same work they say that a Kadiak bear is larger than a Grizzly! To my knowledge there have not been any reliable or extensive comparisons made of the skins, measurements, and weights of recently slain specimens

of these animals; and, as a rule, only their skulls have been used upon which to base specific and subspecific forms—sometimes only the teeth. Geographical distribution, of course, is something, but it is by no means sufficient for such purposes. Doubtless all the Grizzlies are very much alike in their habits, so that a description of the general habits of one kind would answer very well for any of the others.

As a rule, this enormous bear will not attack a man, for his experience during the last half-century has taught him better; with the rapid improvement in rifles, the Grizzly has become more and more convinced that the wisest plan is to keep out of the hunter's way. Still, if brought to bay, or painfully wounded, a Grizzly will

assume the offensive, when it will be the hunter's turn to look out for his life. The bear can stand an enormous amount of punishment; and if he can grapple with his enemy, he can crush a man's skull as easily as one breaks an egg. Grizzlies, when full-grown, have never found any trouble in killing such animals as bison, moose, horses, and oxen, carrying them away to be devoured at their leisure. Apart from man, his great destroyer, he lives supreme in his habitat. It has been said that a cougar could



CLOSE-UP OF A GRIZZLY

Figure 7. In the National Parks where the Grizzly is thoroughly protected, it is a well-known fact that a person can readily approach one of them, when it has been born and reared under such conditions; the animal will never take it into its head to attack one, unless teased or injured. They are seen in great numbers by visitors to the National Parks.

attack and kill an old grizzly, but the story is hard to believe. I have known men in my time who would vouch for having seen a big Grizzly knock down a bull bison weighing half a ton, and drag the quarry away with apparently no more effort than that displayed on the part of any of the smaller animals in dragging off animals they have killed, as large—or larger—than themselves. Many a bull elk has fallen a prey to this powerful and ferocious bear; while ranchmen, in years gone by, in many parts of the West, know full well how handily an old Grizzly can make off with some of their stock. When nobler and heavier game is scarce or unprocurable, however, he will nose around through the forest, digging out with his immense clawed fore-feet

any of the small rodents from their burrows; he will even catch and eat grasshoppers where they are very plenty, or big mountain locusts that are indifferent hoppers. He will eat some fruits, various berries, and the soft, green grass in the open parts of the mountain. Except when young, this bear is not a tree-climber, as he is altogether too heavy and clumsy; but it is remarkable how quickly he can get about, if he chooses. Especially is this the case with the she-bear in the spring,



A GRIZZLY IN CAPTIVITY

Figure 8. Superintendent Ned Hollister, of the National Zoological Park, Washington, D. C., kindly supplied this fine photograph of a big Grizzly; it represents one of Uncle Sam's treasured animal possessions.

when she has her cubs with her; and, unless a man is very powerful, very agile, clear-headed, possessed of nerve, knows a Grizzly, is armed with a heavy, modern rifle, and a crack shot under all circumstances, it would be safer for him to keep well away from an old she-bear.

One of the most interesting experiences I ever had with a Grizzly was during the summer of '77, and it occurred in the northern foothills of the Big Horn Mountains, in the dry bed of a stream called Wolf Creek. At that time I was surgeon with some of the Fifth and Third Cavalry, and they had been in camp for a number of weeks on the plains, about twelve miles north of the stream mentioned. The Sioux Indians were giving us a good deal of trouble, and practically had us temporarily penned in. They were shooting every courier we sent out, and ambushing every one else who tried to reach us. Big game was more or less abundant in the neighborhood, and somebody was obliged to get it, even at the risk of life. Days had passed, and I had been par-

ticularly unfortunate in keeping up my end of the record—so much so that a good deal of fun was being poked at me by the members of the mess and my brother officers in camp. Of course the men and the Indian scouts did not say anything; still, a few of them "looked a heap." I was becoming a little nervous under the treatment, though I had made up my mind to take the punishment, rather than give up the chances of finally bagging something. In this frame of mind, I was lying in my tent one morning, just before the peep of day or about an hour before sun-up, and once more I was seized with the fever to sally out and try it; so, before the desire wore off, I was up and dressed, and found myself making hasty strides in the direction of Wolf Creek, armed with an officer's carbine, a knife, a belt of cartridges, and an army revolver. I had standing permission to make these trips, so long as I did not unnecessarily expose myself to danger from hostile Indians



WINTER COAT OF A GRIZZLY

Figure 9. Another fine picture of one of the big Grizzlies of the Washington "Zoo," supplied by Mr. Hollister, to be used in this article. It was taken in the winter, at a time when this animal is hibernating in nature. Note what a magnificent coat it has.

and returned to sick-call at seven in the morning. This gave me about three hours; but even then, one might run into deer, bear, buffalo, or almost anything else in that locality.

When about half a mile out of camp, I took to the scanty timber and undergrowth that skirted the banks of the creek coming from the foothills, and into which Wolf Creek formerly flowed. Cautiously I followed up the game paths, and with the utmost care peered into every nook and place where a deer might have spent the night, or a bear foraging for what he could find. Every once in a while I would stand still in a likely

place, and listen most intently for at least ten minutes; but no, not a sound that brought the slightest encouragement, and I was doubtless doomed to another punching at the mess at breakfast for being such an incorrigible tenderfoot.

About five o'clock I reached the fork where the dry bed of Wolf Creek began. Here were some signs of game: deer tracks crossed to and fro in the white sand of the bottom of the creek, or more abundantly imprinted on the mud about the shallow pools where they had been drinking. Most of the big timber had disappeared, and, for an acre or so about, the place was filled in with a rather dense growth of young, wild cherry trees. These averaged some eight feet in height, and were laden with ripe cherries—the very thing I thought a bear would appreciate. Beyond and about these trees a scrubby growth was present, disappearing about a hundred yards further on where the foothills commenced, upon which latter were scattered, and not so far apart, dark stone boulders, most of them large enough to hide three or four men. A magnificent morning sun now illuminated the scene, the generous rays penetrating the less dense masses of undergrowth. Although there was no "swamp" about it, the plainsmen often called a place like this a "cherry swamp,"—I suppose for the reason that, in wet weather or during prolonged rains, it became more or less flooded with water. This was not the case now, however; for the greater part it was as dry as a powder-horn, and one could follow the labyrinth of game paths running through it in all directions without so much as dampening one's moccasins.

This cherry swamp was my best hold now; in a few moments I was within its shadows, treading my way slowly and cautiously through the game trails and the old and more widened game paths. Hardly had I penetrated more than forty feet, when I caught sight, by a very small puddle, of one of the biggest grizzly tracks

I had ever seen. The hinder three-fourths of it was impressed upon the smooth, shiny mud, while the immense claws had reached into the shallow puddle. A peculiar sense of delight crept over me, associated with the sudden awakening of all my faculties to their maximum point of keenness, as I realized that I might not come out of that cherry swamp alive. I knelt to make a close examination of the track. The first particles of mud stirred up by the bear's claws had not yet commenced to settle to any extent; therefore, the track was not over ten minutes old, probably less. Putting my ear close to the ground, I listened intently; but, although I heard various noises, none were made by a big bear.

Arising, I loaded and cocked my carbine, and, carrying four loose cartridges in my left hand, I took up the trail. It was not difficult to follow, and I soon met the first sign in the path: a place where he had stopped to eat cherries. This caused me to examine my small-arms carefully, to rub my chilled muscles a trifle, and to peer among the cherry trees in every direction. The slight breeze was in my favor; undoubtedly the bear was between me and the foothills, so, if he did not show fight and started to go, he could run in the direction of



A GRIZZLY IN THE BRONX PARK

Figure 10. Our American zoological gardens usually have on exhibition from one to five grizzly bears at a time; they are interesting animals, if kept in sufficiently spacious dens. Photograph by Elwin R. Sanborn, and published through the courtesy of the New York Zoological Society, as were also Figures 11 and 12.

his home. The place was as silent as the grave, and I was possessed by a very mixed lot of emotions. I wanted that Grizzly in the worst way; I fully realized the dangerous place I had struck him in; and I knew, if a fight ensued, the chances were about equal—perhaps in favor of the bear. Presently I took up the trail again; in Indian fashion, noiselessly I moved along. Scarcely had I advanced an hundred feet, when a peculiar sound coming from my left caught my ear. A kind of swish! then, silence. In the direction of the sound I observed a young cherry shaking. Ah, I thought, he is bending the trees over, sucking off the cherries, and letting the trees spring back. As I rapidly advanced a short distance, I racked my brains as to where I could take up

a position so he would approach me head on, in that I might get a between-the-eyes shot at him. He was not far off, and pretty soon I heard him for the first time—giving little puffs and grunts of satisfaction, but no sign that he had in any way taken alarm. It was after six o'clock, and as I had to be back at sick-call in camp at seven, I did not altogether fancy the way things looked. As I straightened myself up to take a general look-around, and to get the lay of the land as far as possible, a small cherry tree, almost directly in front of me and not over sixty feet away, was bent over as easily as I would bend a broom straw. Noiselessly and rapidly I put in for the point with my very best wits about me.

Judging the distance as best I could, I stopped about twenty feet from where the tree was bent over. Crouching low, I gazed steadily in among the small tree trunks and scattered underbrush. Swish! Up went the tree again, locating the bear for me with absolute certainty. A moment more—and I saw him; but only a small part of his left haunch. He was evidently a perfect monster. I drew a fine bead on the part, and was deliberating whether I should attempt to cripple him or not. My carbine was a piece of considerable power for rifles of that period, shooting the .45 cartridge; and ten times that distance I had shot through two big elk, killing them with one ball; but wapiti and bear are two very different kinds of animals. I had had a friend or two torn up and badly lacerated by Grizzlies

after incautiously crippling the animals. However, as I debated the matter in my mind, the bear moved a few feet, thus passing still further out of view, and then out of sight altogether. I waited patiently five or six minutes, to see if he would not come my way again; but all was silent, no more trees pulled over, and I was getting as mad as a hatter. I made direct for the place where he had bent the tree over—he was gone! I then took up his trail in a fit of desperation, but was soon satisfied that he was through and was going home.

Bouncing out of the swamp, I went rapidly up among the boulders on the first foothill, mounting a sloping one with a good, flat top, which afforded me a fair view. Hardly had I done so, when I caught sight of the Grizzly

about one hundred feet ahead of me up the hill, and he certainly was the most ponderous old brute in the shape of a bear that I had ever seen. Time was limited, so my only chance now was to bring him to bay. I drew down on a spot just back of his ear, and let him have it. No lion that ever lived let loose such a blood-curling roar, and, rolling himself up in a ball, he came down the hill. Quickly I had in another cartridge, and let fly at him. I think I caught him high up in the bowels, for he turned to bite himself most savagely just in front of the flank. This time he saw me, and I began to think he was my bear; but he was on his feet in a jiffy, and, snarling and looking back, with a surprisingly rapid and shambling gait, he was soon among the boulders and close to a big canyon.

In a moment I was down and after him. This time he left a thick, scarlet trail—but it was of no use. I was obliged to return, and I knew it would take at least an hour to follow and overtake him; so, disgusted, I went back to camp. Directly after sick-call I started over to hunt him up, accompanied by Delany, General Crook's old guide, and a few Indians. We struck the trail; but after half a mile the bleeding became very irregular, and we followed him with extreme difficulty. At last the trail was lost—at least I could not follow it—and gave it up. But I shall always think that those Indians found him and slew him; or, what is more probable, found him dead, and passed him over to the hostiles of their own tribe



Photograph by Elwin R. Sanborn.

FINE SPECIMEN OF A BLACK BEAR

Figure 11. Usually this bear is very black, every hair of him, and exceptions to this law of nature are rare. Occasionally one is found with a white patch or a white collar.

all about us—and that was the end of it. However, I was not badgered quite as much as before, and in another year I was continually in demand to join hunting-parties for the killing of big game for the post.

A writer (Morwitch), contributes an interesting and instructive account of Grizzly bears, writing from Missoula, Montana: "Most hunters have a mortal dread of meeting a bear for fear of getting torn to pieces on sight; but I have found the cases very rare where a bear was looking for someone to chew up. In nearly all cases the bear is as badly frightened as the hunter. Bear hunting, as a rule, is too hard work for the ordinary hunter, and to be a successful bear-hunter requires a lot of patience, determination, and a thorough knowl-

edge of their habits, so as to be able to tell just where to look for them. If in the spring, then look where the first vegetation starts, close to the snow line. Although bears never refuse to eat any kind of food at this time of year, yet this is the first place they look for something to eat. As the snow melts away from the hills and ridges, they search these for decayed logs, stumps, and turn over rocks, looking for grubs, ants, etc. As the season advances, and vegetation gets more or less unpalatable, they search streams for frogs, fish, etc.—fish being a choice food for them, especially in a country where salmon abound. From the first of June to the middle of July, they are not confined to any particular spot, but are wandering anywhere in quest of any kind of food. At this season, and the late fall, they are likely to be found anywhere, but most likely not at all, if one is not a very careful hunter. A bear is always on the alert; no sound escapes his notice, and he hears anything; no matter how taken up he is with feeding, he will stand up and listen and look until he finds out the cause—and he is never mistaken. If the sound is not repeated, he at once becomes suspicious and proceeds to leave; and all your climbing and stalking has been in vain as far as

that bear is concerned. From the middle of July, when the berries commence to ripen, these constitute their chief diet—no matter what kind of berries they are, although they prefer black haw, for which they will leave all others. These are found on nearly all the creeks in Idaho, Montana, and the eastern parts of Washington; but as they do not ripen until other kinds are nearly gone, they feed on huckleberries, wild gooseberries, currants, etc. The best time to shoot bears, when they are feeding on berries, is early morning. They feed from sunrise until ten o'clock, and then from three in the afternoon until dark. In places where they are not much hunted, I have found them feeding at all hours of the day. They are extremely cautious, are the most wary of all game, and gifted with a great amount of intelligence. A

hunter's success is in patience, perseverance, a good gun, and the knowledge of how to use it." Another writer says in part: "Of the bear family, we have in the mountain region of Colorado four varieties: the black, the brown, the gray or silvertip and the little range bear. The first is coal black, every hair of him, except in very rare instances. I have seen one with a white strip in his face, and one with a distinct white collar around his neck. He is about twice the height of the little southern black fellow, and more than a third heavier than the one found in the mountains of Pennsylvania and northern New England. The cinnamon is the common North American brown bear, and found nowhere else on earth. He is bigger and bolder than his

black brother; and while he is not aggressive, yet when wounded or cornered he is a fearful antagonist, quick as a flash, and with the strength and staying power of a dozen Corbetts. His greatest weight, at mature age and in best condition, is from eight to nine hundred pounds, and the average is about six hundred and fifty. The silvertip or gray bear is the largest and most pugnacious variety found here, and is the one called "grizzly," although the monster, whose name he has



Photograph by Elwin R. Sanborn.

AT HOME IN WATER AS WELL AS ON LAND

Figure 12. Few are aware of the fact that the Polar Bear is as much at home in the waters of the Arctic Seas as it is on the ice, and that it is quite the equal of any of the seals in the matter of swimming. Seamen report seeing them as much as eighty miles from land or ice floes.

usurped, would make a meal of the Colorado animal, and go to bed hungry. There is a wonderful diversity of color in this species, running from almost black to almost white, that is puzzling to the novice; but it is partly accounted for by the difference in age and the influence of the seasons, and also by the fact that this animal hybridizes with both the black and the brown kind; just as do the gray, black, and red foxes, whose mixture produces the varied and beautiful fox skins. In these mountains it is not an uncommon thing to see a brown or black she bear with two cubs, one of each color, or a silvertip with one dark brown and the other a dirty white. The little brown fellow, called the range bear or "ranger," is the least known of all the family, and is, in fact, very rare. He seems to live, like the mountain

sheep, mostly above the timber line; and in spite of the fact that the taste of the yampa, the sarvis, and raspberry and the choke cherry are unknown to him, his flesh is the only bear meat I have ever tasted that is fit to eat. This little fellow is of light chocolate color; his hair is very long and silky, and his ordinary movements are quick and active as those of the fox. When traveling or hunting for his food, he has a way of sitting up like a monkey every few yards, turning his pretty little head from side to side with all the nimbleness of a squirrel. I do not know whether he can climb a tree or not, nor do I really feel certain that the others cannot; but, singular as it may seem, it is a fact that they never do except as cubs. You may pursue a young one, and if he finds you gaining on him, he will scratch up the nearest tree like a kitten. On the other hand, if a wounded adult should tree you, he will sit at the root thereof till hunger calls him away, or confine his efforts to tearing at the trunk with tooth and toe-nail.

"It has been disputed by many hunters and naturalists that the bear hibernates or "holes up" as we call it here in the Rockies; but I have found several of their winter sleeping-places, and from my own observation I find that Bruin makes preparation for his, or her, three or four months' siesta, about in this fashion: A spot is chosen, generally below the timber line, and always on the north or east of a slope that is sheltered on the upper side by thick-growing pines or the densest 'buck-brush.' A bear never goes into the rock-piles or slides, as they have a way of shifting their positions suddenly. Instead of trusting to these treacherous cavities, he proceeds to dig his own cavern, going straight down for a few feet, the entrance being barely big enough to allow him to work freely. Then he strikes upward, slantingly, and makes an apartment of sufficient size to enable him to turn around or over. At the altitude he chooses, say

9000 feet, the snow sets in at stated periods, early in November, so that he knows just when to retire; and he is generally covered with his fleecy quilt to a depth of three or four feet before we people in the valley have thought of putting up our stoves. The trees above protect him from being irretrievably covered by snow slides; and as the prevailing wind in those localities is from the south and west, he is not likely to be overspread by deep rifts.

"Madam Bruin gives birth to her twins in this dark abode; and they come forth, strong and lusty, with their lean and hungry mother, about the first of April. Now is the time when it behooves the hunter to look ahead and think twice before attempting to catch one of these cute little animals. The mother is never far away, and the faintest whine from one of the babes brings her with the speed of the race horse and the fury of a demon to the rescue. In such a case, the hunter must have what we of the West call "sand," and the rifle must not fail, or there will be a very dead and disfigured man in a few seconds.

"All of the varieties I have mentioned are easily trapped. Unlike the coyote, who will sit on his tail and starve to death in sight of the most delicious morsel if there is any semblance of a snare about it, Bruin will step in and investigate any sort of a pen, whether baited or not. In consequence of this trait, and the fostering of the idiotic bounty law, his capture has formed a profitable industry in Colorado. However, the law has been repealed since, and I sincerely hope that the measure will never be re-enacted."

Some of the best accounts of Grizzly hunts that have ever been published are those told by the late Colonel Roosevelt of his own experiences, and they well exemplify the coolness and daring of that most intrepid hunter of big game.

HE SLEEPS WITH THE BIRDS

PETER PAN, you will remember, lived in the tree-tops. Well, so does Guy C. Caldwell, a naturalist and tree surgeon, of Cambridge, Massachusetts, according to the *Boston Sunday Post*. While this seems to open a rich field of possible ways to beat the profiteering landlord, Mr. Caldwell's first "flier" into the tree-tops was actuated, not by a desire to escape inflated rents, but by a very real necessity to escape pursuing mosquitoes. He says one hot evening he had slung his hammock under the trees, as the coolest spot he could find, but that soon in sheer self-defense he took to the "tall timbers" where he slung his hammock, well protected by extra ropes and a safety device of his own invention. (See contents page.) This was rather a desperate measure, for an ordinary man, but Mr. Caldwell is not an ordinary man. He is a naturalist and a real lover of trees. Each one

is to him a living thing, with character, moods and personality. He has turned his natural love for trees and his wide knowledge of them to good account in the devotion of his time to the very practical science of tree surgery. During the war Mr. Caldwell served in the Navy and his spare time was spent studying sea birds and marine flora. His navy training was undoubtedly of service to him in making easier his rapid ascensions to his aerial bed-chamber, and in fitting him to rig up quickly, almost anywhere, an outfit which will enable him to get into the tree-tops quickly in order to observe to the best advantage the intimate family life of his feathered friends, to study their habits and become even more expert than he now is in his marvelous imitation of their calls and beautiful music.

THE GIANT CYPRESS OF MEXICO

WITH full appreciation of the beauty, and recognition of the majestic size of the giant cypress of Mexico shown in the accompanying photograph, exception must be taken to the supposition that it is the "oldest tree in the world." The honor of being the "oldest living thing" belongs to the General Sherman tree in the Sequoia National Park in California. These Mexican cypresses grow to enormous size, and are believed to attain an age of 2000 years, but it must

(*T. distichum*). While the Mexican species is not, in general, believed to be extraordinarily long-lived, a few isolated trees have become famous on account of their enormous bulk and age. The tree shown in the illustration is believed to be the largest and oldest of the notable examples of this Mexican cypress. It stands in the church grounds in the center of the little village of Maria Del Tule, which is on the road from Oaxaca to Guatemala by way of Tehautepec. This tree is



(Photograph copyrighted, 1920, by the Curtis Publishing Company.)

THIS PHOTOGRAPH, BY DR. E. J. DILLON, REPRODUCED THROUGH THE COURTESY OF THE SATURDAY EVENING POST, OF PHILADELPHIA, SHOWS ALVARO OBREGON, MEXICO'S PRESIDENT, STANDING IN FRONT OF A GIANT CYPRESS IN MEXICO. THIS TREE HAS BEEN NOMINATED FOR A PLACE IN THE HALL OF FAME BY MRS. M. E. JUDD, OF DALTON, GEORGIA

be remembered that the General Sherman was "a lusty youth of fifteen hundred summers when Christ was born." Its exact age cannot be determined without counting the rings, but it is probably well in excess of thirty-five hundred years. The General Sherman, greatest of all the celebrated Sequoias, with stupendous proportions admitting of no exaggeration, stands unassailed as the largest and oldest living thing.

The Mexican Bald Cypress (*Taxodium mucronulatum Tenore*), is very closely related to our bald cypress

about 150 feet high and has a maximum diameter (measured near the ground) of 40 feet. At five feet from the ground its actual diameter is about 35 feet. The spread of the crown is 141 feet and its age is estimated to be about 2,000 years. As is the case with a good many Mexican trees, this cypress, long known and famous among the inhabitants of the country, has been known to science only since 1853, and even then it was first described from trees cultivated in Italy.

THE SANGRE DE CRISTOS

BY ARTHUR H. CARHART

THE Supervisor had staged the climax wonderfully well. We had traveled all morning in the close confines of the South and North Hardscrabble canons. The last long climb had taken the auto which carried us up to saddle land of the Greenhorn's backbone and there as we swung around a turn stood the most majestic single peak line mountain range I have ever seen and probably ever will see, the Sangre de Cristos. The

effect was as if one had been listening to the fantastic playing of some barbaric dance on violin which had gradually diminished until the muted strains had swung to a theme of pleasant uplands and then—a crashing,

majestic full-toned triumphal march burst into full harmonic melody in the theme of the Sangre de Cristos. No orchestra, no orchestral band, no gigantic pipe organ ever equaled the majesty of the theme which fairly

thundered up on us as we swung around the hill into the view of this mountain range.

There were four of us in the party. The car was driven by Mr. A. G. Hamel, supervisor of the San Isabel National Forest,

and the man in whose care was intrusted this unmatched grand symphony of marching mountains. The trip was under his personal guidship and he had made us get on the road early this day so we might see his pet moun-

The San Isabel National Forest, in southern Colorado, is one of the most interesting of all forests. Many types of scenery are in its offerings, but none are more beautiful than the Sangre de Cristo range. It is nearly 100 miles long, extending from the Arkansas river to near the southern boundary of the State. It is pronounced by many the most beautiful mountain range in the world, and this may be due to the presence of the broad valley on either side from which the range is viewed. Almost every high peak in the range reaches 13,000 feet and at least five are over 14,000 feet. It is exceptionally attractive to the mountaineer, for three of the peaks are very rarely climbed. The beauty of the range when capped with snow is almost indescribable. No master writer or painter has ever been here to record by pen or brush the dazzling splendor of these peaks. It may be that this little article will bring one such the few miles necessary from the beaten paths of the traveler to give to the world some written or painted description of this sublime range of mountains.—Arthur H. Carhart, Editor, Recreation Department.



PART OF THE BEAUTIFUL SANGRE DE CRISTO RANGE FROM THE WET MOUNTAIN VALLEY

"And then—a crashing, majestic full-toned triumphal march burst into full harmonic melody in the theme of the Sangre de Cristos. No orchestra, no orchestral band, no gigantic pipe organ ever equaled the majesty of the theme."



A SNOWBANK IN JULY

Snow can be seen in the crevices of the Sangre de Cristos any month of the year. High in the mountains it stays in patches many feet deep during the entire summer.

tain range in its happy morning mood. Three of us composing the remainder of the party, included a captain of engineers of the American Expeditionary Forces, my wife, and myself. The dusky dawn had seen us swing along a canon road, past sheer cliffs and tree covered slopes so we might get this view as the Supervisor had planned. All remembrance of early rising, of breakfast



THE SIERRA BLANCA, FROM THE TIMBERLINE

At the southern end of this magnificent range stands the fifth highest peak in the United States. Around its shoulders hang nine lakes and from its sides course many streams flecked with cascades and falls. Few peaks in the nation offer the strenuous test of mountain climbing which Blanca presents. To climb to the top of this monarch is a feat for an expert mountain climber.

eaten by lamp light, of the scary canon road, was whisked away by this flood of splendid nature harmony which confronted us.

I like to think that this morning we traversed the same route traveled by the early Spanish adventurers, who gave the name to the Sangre de Cristos. Legend tells of this christening. Years ago before white settlements had been made on our eastern shores Spanish explorers carried to the City of Mexico news of a mythical city, Quivira. In this city gold was a common metal, and gems of rare qualities were many. Adventurous spirits among the Spanish conquerors traveled through many miles of territory infested with Indian foes, trying to find this new land which to them meant a new Peru to conquest.



SANGRE DE CRISTO PEAKS AND THE QUIET VALLEY

In the valley are many peaceful ranch places where all is restful. Back of these stand the scraggy pinnacled mountains. It is perhaps this striking contrast which makes the range so regal in its display of strength.

But no man ever saw this mythical city. One band, however, glimpsed a magnificent piece of God's handiwork, never equalled in splendor by the most fanciful imaginings of adventure seeking Quivira. For this band early one morning came over a low highland of the Greenhorn range and beheld, in magnificent splendor, the high range of the Sangre de Cristos. The sunlight streamed through the upper misty levels of the plains atmosphere hundreds of miles east and produced for these dark skinned Europeans a phenomenon since viewed by many residents of the Wet Mountain Valley. Only the red rays of the sun struck the peaks and high snow covered range. Mists rolled over peak and ridge. The

luminous spectacle held these beholders breathless. The whole range seemed fusing and changing. Actually, the clouds moving down the slopes appeared like great masses of slow moving, thick, viscous fluid. All stood dumb until one, finding his tongue, whispered partly an ejaculation, but mostly in reverential awe, "Sangre de Cristo."

And thus the range called "Blood of Christ," or as the Spaniard called it, "Sangre de Cristo," received a name which has lived. This is in some measure due without doubt to the fact that when atmospheric conditions are right this blood red light floods the peaks, recalling the origin of the name. Almost of a certainty the wonderous blood red color will clothe these slopes several times each season and if perchance at-



THE GREATEST MOUNTAINS OF THE SAN ISABEL NATIONAL FOREST

Often one returns to find a dream of scenic splendor dimmed through having seen many things meanwhile—but one comes back to the Sangre de Cristo and finds the same appeal.



SANGRE DE CRISTO RANGE

No range offers so many peaks to be scaled all within easy reach of the broad valley floors which come to the foot of the single line of peaks on either side. Nor can one find a range where the base of the mountains hide so many pleasant camping and picnic spots in literally hundreds of large and small canons.

atmospheric conditions remain the same for several days, each morning within the time will witness the grandeur of this coloring.

But it was not our good fortune to witness this play of freakish sun rays. Instead the line of peaks in front of us stood in clear brilliant whiteness so far as the eye could see to the north and to the south. Each looked like some mammoth conical dish of ice cream lying just beyond our reach. In truth, they were not less than thirty miles, and possibly nearer fifty, from our car when we sighted the whole range.

Through the little mining village of Querida our car sped, bearing us ever nearer the brilliant mountain range. Ever the mountains seemed just a few miles away, their

apparent distance remaining constant in spite of our having traveled not less than ten miles since first sighting their high pinnacles. Querida is a little mining



CRESTONE NEEDLES

Here is the master feat for mountain climbers! So far as known, this peak which is in the most rugged part of the backbone of the Cristos, was never climbed until July 4, 1920, when a party of four, starting at 3 A. M., reached the tip of this pinnacle, 14,233 feet high, at 4.15 in the afternoon. Three of the party were members of the Colorado Mountain Club, and the fourth was a resident of the valley. All were skilled and hardy climbers.

settlement, which seems to snuggle down into the hills, trying to forget the present in drowsy remembrances of its past. The coming of our car to the town must have been an event for several men quit work where they were wrecking some old mine buildings for the lumber to be salvaged, and one or two women peered at us out of cabin windows. These were the only souls we saw in this old settlement, which one day in the past was a famous city of Colorado, and was at one time talked of as a location for Colorado's State Capitol.

But past glories and activities of man and the shroud of romance of the past which, today hangs over Querida, could hold our attention only so long as we were unable to gaze upon the Sangre de Cristos. A moment after we passed the last mouldering prospector's cabin, again swinging around the side of the hill, we came into the presence of the mountain range masterpiece of the San Isabel. From there on, mile after mile, we traveled towards the range with its lofty peak tops ever in vision. Did we travel a foot towards these craggy heads they came no nearer. If we covered a mile on the road they seemed as far away as ever.

The whole Wet Mountain Valley spread before us as a great landscape unit as we came to the foothills of the Green-horns. Two small groups of white and colored dots were pointed out as the houses of the towns of Silvercliffe and Westcliffe. We knew that the latter was where we were to board a train and it seemed almost ludicrous that we should expect to find an engine and cars there, so tiny did the wee town seem, dwarfed as it was by the breath taking sweep of range and valley.

Skimming along over a road that climbed down into the valley the Supervisor pointed out to us the different peaks of the range. He told of lakes hidden under frowning cliffs that stood hundreds of feet above the water surface. Some of these cliffs we saw from the car, but the distance and the massive uplifts of which they

were but small parts, made them seem like mere ripples on the earth's surface. He told of lost gold mines in the range, of great forested areas, of rugged creeks cut by ancient glaciers, and with every new fact told, and with every look at the range, we all knew that some day we would return again to this valley, and on that visit, before we bade good-bye to the peaks and the valley, we would have trod the slopes of the range, sniffed the spicy airs of the forest, and scaled the heights of some of these peaks which we now had to pass without getting an intimate touch.

So finally we came to Westcliffe and the end of the railway. And there we did find a town and a train. After a very hasty lunch and a parting word with our host, the Supervisor, we boarded the train with regret, and then left the valley and its sentinel peaks.

But I knew that no matter where I went, or what mountains I might view, some day, as soon as I could, I would return. And I feel sure that while the other two visitors to the valley spoke no resolve that they too knew that they would return, for that is the way you feel when in the presence of the Sangre de Cristos.

Of the three of us that left the valley on the train that day, so far, I, alone have gone back. Four months later I came to the valley over the same twisty railroad with the same snorting, little engine pulling the mixed train of passenger coaches and freight cars into the valley. Often you return to find your dream of scenic splendor dimmed through having seen many things meanwhile. But although I had viewed the country of the Shoshone, had visited Yellowstone Park, and had viewed many other things known as superlative scenery, I came back to the Sangre de Cristos and there found the same appeal, the same majestic qualities I had met on that morning when the Supervisor had said, "Now meet my pet mountain range, the Sangre de Cristos."

OUR NATIONAL TREE

WHAT should be our national tree? Thousands of grownups and thousands of school children, at the suggestion of the American Forestry Association, are now voting on this question. The number of candidates is really surprising. There is black walnut, and hickory, and elm, and ash, and oak, and white pine, and spruce, and longleaf pine, and Douglas fir, and redwood, and a host of others. Hardly a tree can be mentioned that does not have its particular champions, and every one of them has its own peculiar claims for consideration. Perhaps it will turn out that to do impartial justice we shall have to have several national trees!

However that may be, it is certain that the present friendly competition between the various trees and their admirers has an important educational value. Classes of public school students are being interested in the trees in a way they never were before. They are learning to

tell the different kinds of trees apart in summer and in winter, and to call them by their common names or by their more dignified Latin titles, as occasion may require. They are learning how trees grow and reproduce, and what kind of a climate and what sort of a soil each one likes. And above all, they are learning what the different trees are good for, what part they play in the life of the community and of the Nation, and how important it is that we should take steps to assure ourselves permanently of an ample supply of trees and forests. Grownups, too, are learning these same things and are getting to know the trees in the familiar sort of way which will make them more appreciative of their true value. Who knows how much new and effective support the national tree contest, indirect as the connection may seem, may bring to the national forestry movement.

FOREST ODDITIES—THE BIGHORNS OF OURAY

BY ARTHUR H. CARHART

MAYBE the fact that wild mountain sheep will come into the main street of a town is not an oddity. Maybe the Creator planned for all living things to be at peace so wild things could travel in Man's lands without fear. But with the present general dread

waterfalls in the state, a famous canon is but a moment's walk from town, and there are hot springs and other attractions to be visited but unless the traveler gets the opportunity to see the sheep of Ouray his visit there is not quite complete.

These sheep are at home in town. They roam the mountains wholly unhampered but have adapted themselves to urban conditions as well. It would be hard to conceive a more striking contrast to usual conditions than that shown in the pictures, where these sheep are raiding hay stores in a railway car within a few feet of a depot and in the heart of town. One old buck, whose horns show he is many summers old, has used his crag-climbing skill to get into the car and seems as much at home there as on a mountain top.

That there are bighorn sheep around Ouray is not strange for the country is their natural habitat. That the people of the town are interested in these sheep is not an uncommon thing. But the fact that these wild things

are so much at home in town and that the people have shown real action and results arising from interest they have for their wild neighbors is altogether an unusual combination. Ouray may well be proud of its odd



(Photograph by Christopher.)

INVESTIGATING THE POSSIBILITIES OF GETTING A GOOD DINNER

in wild animals of all that is man-made it is unusual that a bighorn sheep would come to the main thoroughfare of a town and pay his respects to the business houses.

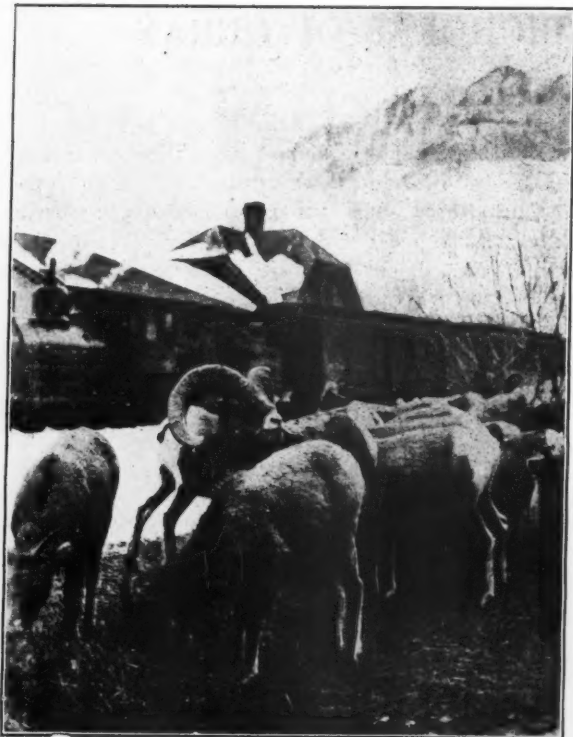
But with all of the unusual features of such a situation there is one place where it happens. The little city of Ouray, Colorado, nestles in a vast amphitheatre of rugged mountain sides and within the boundary of one of the most scenic of all National Forests, the Uncompahgre. From these rugged slopes each winter come bands of bighorns to accept the hospitality of Ouray. For the town is host to these wild neighbors giving them feed of good hay, helping them in wintering through.

And the sheep reciprocate by remaining around the town all through the year and forming one of the greatest attractions to the tourists who happen to visit this scenic area. There are here some of the most spectacular



(Photograph by Christopher.)

HAVING DISCOVERED THE HAY IN THE CAR, THEY PROCEED TO GET ABOARD AND ENJOY IT



(Photograph by T. J. Watkins.)

THESE SHEEP ARE WITHOUT FEAR FOR THEY KNOW THEY WILL NOT BE HARMED

winter citizens, the band of wild bighorn sheep which makes that little city headquarters during the months of snow.



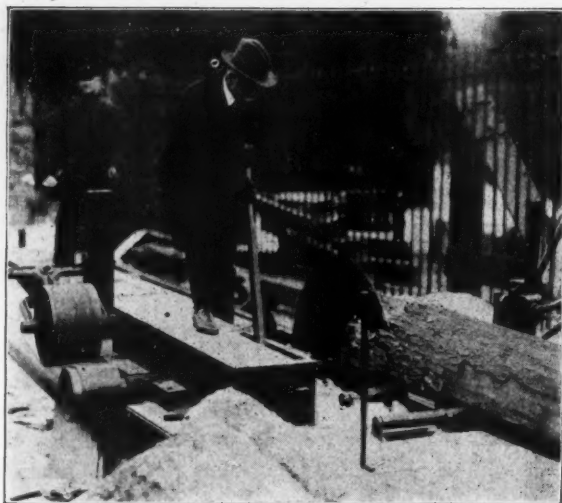
ART AND SERVICE

In Phoenix, Arizona, the owners of an automobile service station at one of the down-town corners built their mission-style structure around a great palm tree, rather than cut it down to make room for their place of business. They have aptly given the name, Palm Service Station, to their establishment.

FORESTERS MEET MONTHLY

THE Foresters located in and about New York City are meeting regularly on the first Thursday of each month at 1 P. M., at the Yale Club for luncheon. This offers a fine opportunity to talk things over and some very interesting discussions have already developed through the meeting of Messrs. J. E. Rothery, Barrington Moore, Ernest A. Sterling, Hugh P. Baker, Nelson C. Brown, and R. S. Kellogg. All Foresters who happened to be in New York the first Thursday of each month are cordially invited to join the company. It is only necessary to notify or telephone Nelson Brown, at 506 Hudson Terminal, 30 Church Street, New York (Cortlandt 1556).

CENTRAL PARK UTILIZES DEAD TREES



PARK COMMISSINER FRANCIS D. GALLATIN DEMONSTRATING THE SMALL SAWMILL RECENTLY INSTALLED IN CENTRAL PARK

THE Department of Parks of the City of New York is doing a splendid thing in the utilization of the dead trees in Central Park. "We have installed a portable drag saw," writes J. S. Kaplan, Forester of the Department, "which first bucks the tree up into logs, then a wood mill which saws the log into stove wood length, and a splitting machine which splits these bolts into stove wood size. In addition to this, the saw mill shown in the photograph for making rough lumber out of red oak, ash and other trees from which we can get at least a twelve-foot length. The stove wood is distributed to the poor during the winter at distribution stations established throughout the city. During last winter, at times, we were able to help out the Department of Education, who used it almost exclusively for fuel in various school buildings."

MYSTERY OF AN ABANDONED ORCHARD

BY J. OTIS SWIFT, AUTHOR OF "WOODLAND MAGIC"

THIS winter morning while the eves of the house here in the Manor at Hastings-on-Hudson are adrip with melting snow that fell during the night, I want to take you over through the soft yellow sunshine to the Grassy Sprain Valley and the old abandoned orchards on the hillside above the Yonkers reservoir. Though the ground is not frozen we have found a thin veil of snow over the dun brown grass, like a heavy frost, on many mornings lately. It will have evaporated before the sun is well up. We go over through the woods at Hudson Heights and cross the mystic little Nepperhan River, that Washington Irving mentions, on the stepping stones where the lady beeches lean lovingly over. I wonder how many generations of lovers, American, Colonial English, old Dutch, and Algonquin, have crossed over these smoothy worn footstones? I don't know why, but steppingstones in a brook always make me think of lovers—and one who has not forgotten how lovers feel is a fit novice to go out into the forests for a day's ramble with that oldest lover in the world, Dame Nature.

Back in that romantic age before Christianity, when nearly all the known world worshipped Cybele, the goddess of Nature, who, under many names, held sway over the hearts and minds of men from the shores of the Mediterranean bowl eastward across Asia Minor, they used to picture the sweet girl goddess as sleeping the long winters through guarded by the lions in her mountain caverns. But I think we have learned a few things in these latter centuries. For the forests never seem to me so redolent of her entrancing personality as in the sleepy winter time when the great tulips, sycamores, oaks, black birches and red elms, their feet wrapped in warm leaves and snow drifts, all the little baby shrubs tucked snugly in like cherubs in their cradles, stand whispering and gossiping and laughing together far and wide through the forest.

Then in the Spring, when patches of clean washed dead brown leaves appear between the deep woodland

snows, and Cybele, her tawny hair flying over her girlish bare shoulders, her light filmy robes drifting about her lissom figure, comes dancing and laughing through the forest calling all her little plant and big tree folk to awake, we can see where her pink toes have touched the brown sward lightly, have stirred the still green Christmas ferns, by the trailing arbutus breaking into pink, the hepaticas into delicate blue, and the spring beauties into pinkish white.

But by now we have passed the *pro bono publico*

spring in the edge of the wood and have torn our way through the smilax, raspberry, button-bush and snapwood of the Sprain Brook bog and out into the old field across which is the State road. It is called the Sprain Road and is bordered by a crumbling stone wall, eloquent of backaches long forgotten. Poison ivy covered with waxen gray berries, woodbine knitting the lichen-painted stones together, blackcap raspberries, blackberries on either side, bright red dashes of color where the black alder—our local holly—lightens up the tangle, and crawling grapevines clamber over walls, fence-rails and cedar bars. Sometime before the Civil War—and how long ago that seems now since we have seen our boys come back from the heroic fields of France—this was a prosperous farming community. In the jungle

of half-grown sassafras, locust, black walnut and sumachs, the larger walnuts were neatly tagged during the war by the Yonkers Boy Scouts, there are old cellars overgrown with weeds, raspberries, wild roses and catbriar.

As we step into one of them through the gaping Southern wall all the romance, melancholy and guessed-at tragedy of uncovered Pompeii and Herculaneum sweep over us. Who lived here? When did the creeping, inexorable front trenches of the forest advance across the brook and cultivated fields, and why? As we stand here guessing, we stoop to scoop up a handful of the crumbling mortar and ashes on the cellar floor—and come upon the economy of Mother Nature who



THE MYSTIC LITTLE NEPPERHAN RIVER WITH THE LADY BEECHES LEANING OVER

begins, as soon as man has given up the fight and retreated from some homely, hideous spot of earth, to cover it with verdure and make it beautiful—for the mass is full of the nubby roots of the blue violet, green

our this-generation intellects, and that's why our conscience pricks a little, and why our intellects hurry to tell us that it is all right, and no harm done, and that there are no Little People, anyway. Nevertheless, we put the bloodroot back and carefully bury it so it will grow next spring. We wonder, as we go up over the hill to the Grassy Sprain forest, just why we replaced the roots.

There is no place more entrancingly mystic and suggestive, so legended, so interesting, as an old abandoned orchard returned years ago to pastureland and grown up to a tangle of young forest trees. One looks furtively about among the woodpecker embroidered trunks half expecting to see the hairy shanks and little sharp black horns of Pan and to hear the piping of his reeds as he dodges our search. Here we come suddenly into such a sanctuary. It would take me all day to tell you of the surprises, the bits of human history half revealed, in this old orchard. It is haunted with black-and-white and brown garbed chewinks and reddish-brown tailed hermit thrushes with speckled vests, in summer; with rabbits, coons and foxes in winter. Snuggling

about the gray old ledges worn smooth on the western side by the glaciers that ground off the tops of the Palisades which we can just see over the hills to the west, are delicate little ebony ferns, tall, slim, lance-like blades of green that seem to prosper rankly on the worn-out soil of this old orchard, but dwindle, once their poverty is replaced by the rich environment of a cultivated garden. In



WE HAVE TORN OUR WAY THROUGH THE SPRAIN BROOK BOG

where the sunlight has reached them, and the chubby red roots of the bloodroot, *Sanguinaria Canadensis*, the sharp sprouts already pointing upward for next spring's delicate white blossoms.

We have broken a root in digging it up, and it bleeds like a cut finger. We are sorry that we disturbed it, for isn't there some distant cousinship between this little red-blooded haunter of the waste places and ourselves? Are they talking to us, the Little People, who surely must live in the chinks of the old cellar stones; the familiar spirits, the little Trilbys who stole the cat's milk from the ingleside and frisked before the buxom young housewife on the hearth from their hiding place in the chimney corner of this one-time home? Are they peeping out of nook and cranny with angry little eyes because we have dared dig up the wild garden they have planted to cover the tragedy of a forgotten heart?

"Who do you think gathered the shiny seeds of the bloodroot and the wild ginger from the sidehills and planted them here to make a lovesome spot of this old ruin?" they are asking us. "Do you think we did it just for idle saunterers to dig them up and destroy them? Away with you, before we turn you into dried sticks or withered mushrooms for the wind to blow about!" It is our old, old inner minds that hear these things, not



WHEN THE GREAT TULIPS AND SYCAMORES WHISPER TOGETHER

the crack of a ledge, full of black loam, we come upon the dried stalks of the blackberry

lily with the shiny black seeds still clustering at the ends of the flower stalks like luscious blackberries ripening in January. It is an escape from some old garden—but where was the garden, one wonders? Maybe the birds



AN OLD ORCHARD RETURNED TO PASTURE LAND

brought the seeds here originally, or perhaps the Belamcanda, an East Indian name of the species, has outlived every vestige of some old Dutch cottage garden that once bloomed in this ancient orchard of Grassy Sprain.

All through the tangle of wild appletrees, young thorny locusts, cockspur thorns, and dense clumps of pink azalea and candleberry bushes are fine big sassafras trees. There are large black-heart cherry trees that seem to have gone wild in this locality but bear wonderfully in season. Clambering among the tops of the twenty-foot locusts are masses of black frost grapes which the birds come twice a day from the woods to feast on, even in these thawing mid-winter days. There is still so much to eat in mid-winter in the forests that I have wondered whether a naturalist would starve, if he had a hatchet, trowel and pocketknife with him. There are paths wandering among the candleberry clumps—the bayberry, two or three of whose leaves thrown into a soup certainly improve the flavor, and whose waxen berries, ash-gray, our grandmothers used to gather to make into candles that, burning, filled the house with such mystic fragrance that to this day we like to have them at Christmas time to remind us of the old-time romance of the American Colonial Yule-tide. The paths wander here and there among the appletrees and junipers—Gypsy paths I think they must be, for who but the Romany people are there, among the sons of men in towns, who would leave their money-grubbing nowadays to make them and keep them worn and clean swept? Of course there are the tales of the old herb-gatherers about what they have



BIG SASSAFRAS TREES AMONG THE TANGLE

byways from the spearmint beds over by Grassy Sprain Lake. They are always seeing things that no one else sees in the forest—these old herb-gatherers—and their tales of brownies, and wood-gnomes, sweeping the forest

paths of leaves and brushwood—well, they somehow make us sensible people nervous after sunset!

The forest that crowns the top of the hill and sweeps down to the lake shore—the Grassy Sprain reservoir of the City of Yonkers—is of hard wood, giant old



THE LITTLE PEOPLE SURELY MUST LIVE IN THE CHINKS OF THE OLD CELLAR STONES!

white and red oaks, lady beeches, black walnut and hickories. It is a sanctuary for birds and small animals, as well as for some of our most valuable timber trees. There are interesting things about the forest of Grassy Sprain to the botanist, though it is only a woodlot compared

with the Adirondacks, the North Woods of Maine, and our Western forests. In the tangled underbrush of deep ravines grow the showy orchid, the pepper-root, maidenhair fern, moonwort, jack-in-the-pulpit, white baneberry, the pungent wild ginger, and many other rare and beautiful denizens that show that this wood, a part of it at least, was never cleared. We start home through the gathering dusk, glancing curiously between the dead brakes and candleberry, lest we shall see—but, Good Gracious! Suppose we *should* see? After all, why worry lest we come suddenly upon a little old man knee-high-to-a-grasshopper, a bearded little old dwarf in a leath-



IN THE CRACK OF A LEDGE—THE DRIED STALKS OF THE BLACKBERRY LILY

seen in the gloaming, in the treacherous light between sunset and moonrise when returning through these

er jerkin and frog-skin leggins, sweeping the paths with a birchen broom? Aren't we secretly hoping that we *shall* be startled in just such a way as a sort of climax to our day of following the fleeting notes of Pan's pipes through the Grassy Sprain woods?

*"There is no rhyme that is half so sweet
As the song of the wind in the rippling wheat.
There is no meter that's half so fine
As the lilt of the brook under rock and vine,
And the loveliest lyric I ever heard
Was the wild-wood strain of a forest bird."*

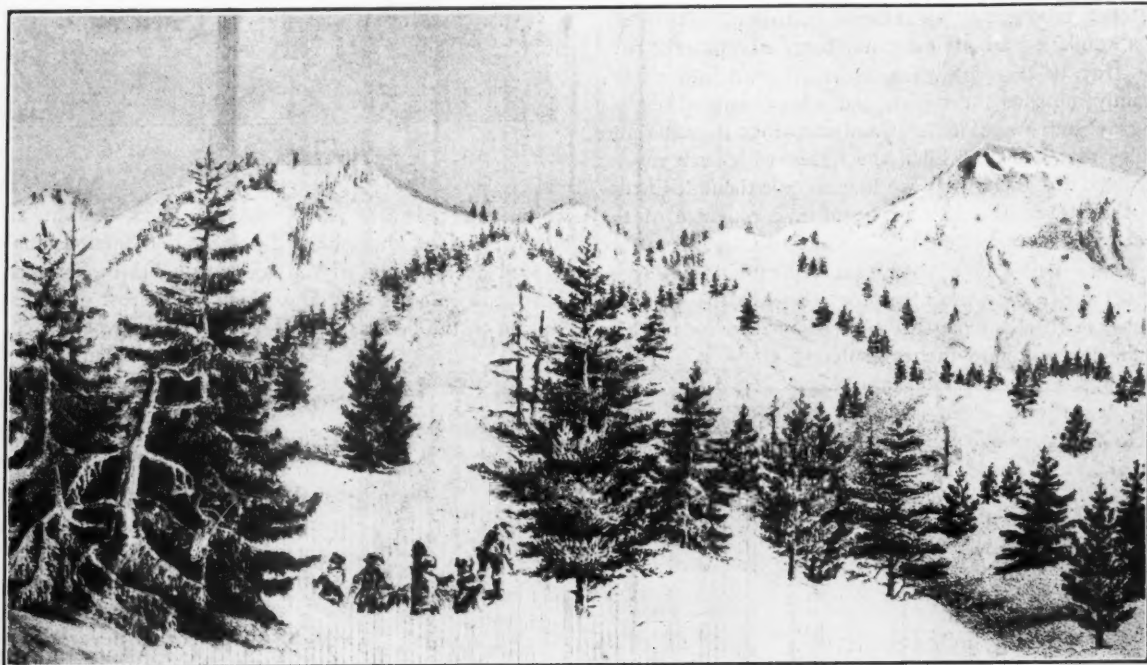
—Carwein

"HALL OF FAME" FOR TREES

From the original report published in 1845 is reproduced a picture of the spot of the location of the Kit Carson Tree, nominated for a place in the Hall of Fame by F. N. Fletcher, of Carson City, Nevada. This sketch was made by Mr. Preuss, the artist who accompanied the Fremont expedition.

The Kit Carson Tree is at the summit of the Carson Pass over the Sierra Nevada Mountains in Alpine County, California. On this tree Kit Carson, famous hunter, guide and Indian fighter, cut his name on February 20, 1844. He was then guide and hunter for Colonel Fremont, who was engaged in the desperate endeavor of crossing the Sierra Mountains in the dead of winter in order to reach Sutter's Fort on the Sacramento River. The Fremont Expedition had left Kansas City in May, 1843, and had reached tide-

searching for the mythical river of which the Indians had told the Spaniards two hundred years before. Striking the east fork of the Walker, which he two years later named for Joseph Walker, he followed it up to its headwaters and then crossing the divide to the west he came to the west fork of the same stream which he followed down for several days, thus in a measure doubling back on his course. Finding no west-flowing stream and being nearly destitute of supplies he turned directly west across the southern end of Carson Valley and essayed the well-nigh impossible task of crossing the snow-covered Sierras in winter. On February 20 the expedition came to the summit of the mountains at a point about sixteen miles south of Lake Tahoe. On one side of this pass they found that the waters flowed to the east, and on the other to the west. Leaving his party



LOCATION OF THE FAMOUS KIT CARSON TREE

water on the Columbia River in November. After securing supplies from the Hudson's Bay Company at old Fort Vancouver Fremont set out on his return to the States, but he left the Columbia and went up the Falls, or Deschutes River, in order to cross the Great Basin and locate, as he says, "the reputed Bueneventura River, which has had a place on so many maps, and countenances the belief of the existence of a great river flowing from the Rocky Mountains to the Bay of San Francisco." This river had been proven a myth by Jedediah Smith in 1827, and by Joseph Walker in 1833, as Fremont should have known. The desert country into which the expedition fell after leaving the Deschutes River and the mountains, seemed to render hopeless the route to the States at that season of the year, so the leader changed his objective to California, by way of the Bueneventura if he could find it. Coming down to Pyramid Lake in Nevada, which he named, he skirted the Sierra Mountains along their eastern foothills

in charge of Carson, Fremont with one man had pushed ahead to reconnoitre and had satisfied himself that he had "struck the stream on which Mr. Sutter lived." Incidentally he had discovered Lake Tahoe, "a beautiful view of a mountain lake at our feet." Returning to his party he found it occupied in making a road (for the horses) and bringing up the baggage; and "on the afternoon of the next day, February 20, 1844, we encamped with the animals and all the material of the camp, on the summit of the Pass in the dividing ridge, 1000 miles by our travelled road from the Dalles of the Columbia." Some years later a pine tree growing at the pass was found bearing the inscription: "Kit Carson, 1844." In order to preserve it from decay and possible vandalism, the tree was cut down in 1888 by William Thornburgh and J. F. O'Gorman and the section bearing the name was sent to Sutter's Fort, where among other interesting historic relics it may now be seen. Another

"HALL OF FAME" FOR TREES

most interesting relic of this expedition, the 12-pound brass howitzer which had been mounted on wheels and dragged all the way from Kansas City until it had been regretfully abandoned in the snows on the west fork of the Walker, now stands under a pine at Tahoe City overlooking the lake. The expedition suffered almost incredible hardships on its journey from the summit to Sutter's Fort, but finally

arrived there without the loss of a man. Kit Carson had been in California twelve years before, but he had entered the State from the south on a trapping expedition from the Colorado River. His only other known visit to the State was in 1853, when he drove a large band of sheep from his home in Taos, New Mexico, across the Great Basin and the Sierras and sold them in "one of the frontier camps."



THE BEAUTIFUL HILGARD CHESTNUT

Named for the first dean of the College of Agriculture at the University of California the Hilgard Chestnut is submitted for the Hall of Fame by M. B. Pratt, the deputy state forester of California. The State Board of Forestry of California has the picture in its collection and the description is furnished by Professor Woodbridge Metcalf, of the division of forestry of the University of California. The tree stands in front of Agricultural Hall near the north fork of Strawberry Creek on the University of California campus at Berkeley. It has always grown in the open without interference from other trees and is therefore low-branched with a wide-spreading rounded, symmetrical crown. It is now 41 inches in diameter at one foot from the ground but at about four feet the trunk divides into eight spreading branches. These being so near the ground make climbing easy and the tree

is, therefore, a favorite roosting place for children living about the campus. The crown has reached a height of 35 feet in its 35 years and its branches spread over a circle about 50 feet in diameter. Dr. Hilgard was the first dean of the College of Agriculture, foremost soil expert of his generation and one of the pioneers of agricultural education in the United States. This fine old tree was planted in 1885 by Waldemar G. Klee, a Danish gardener, who, at that time was superintendent of the gardens and orchards of the College of Agriculture, under Dr. Hilgard; it is only since the death of the latter in 1915 that the tree has been given his name in appreciation of his work for California agriculture. The tree is the Italian variety (*Castanea sativa*).

MONEY FROM MAPLES

MANY thousands of American farmers throughout a region comprising more than a score of States are overlooking opportunities to secure delicious maple sugar and sirup for home use, as well as for sale, at very little cost.

This statement, of peculiar interest because of the present sugar shortage, and the approach of "sugar weather," is based on data compiled by experts of the United States Department of Agriculture who have made a special study of the maple-sugar industry. While Americans commonly think of this industry as being confined largely to circumscribed areas in New England and New York, there are, as a matter of fact, many potential "sugar bushes" throughout eastern and north-eastern United States; in other words, throughout a region extending south to include North Carolina and Minnesota. There are also a considerable number in Tennessee and west to include northern Missouri and Iowa of maple trees of a sugar-yielding species, as well in Washington and Oregon.

While some experience is necessary to boil the sap down to sirup and sugar properly, the process is not complicated and may be learned readily. A United States Department of Agriculture bulletin, "Production of Maple Sirup and Sugar," gives the necessary information, and will be sent free to any person addressing the Department at Washington.

A clump of 10 to 15 trees usually will yield enough sirup for family use to make tapping worth while, and in many cases will afford a surplus which can be sold at a remunerative price. The flow of sap depends upon the age, condition, and habit of growth of the trees, also upon the character of the weather and condition of the soil during the sap-flowing season. In a good season a tree 15 inches in diameter will yield sufficient sap to make from 1 to 6 quarts of sirup, which in turn can be concentrated into 2 to 10 pounds of sugar. Larger trees under the same conditions will produce correspondingly large yields of sirup and sugar. All hard maple trees, 8 inches or more in diameter, may be safely and profitably tapped for sirup and sugar production.

Recently an investigator of the United States Department of Agriculture in North Carolina discovered many groves of sugar maples that were not being utilized for sirup and sugar production. One of these groves is probably larger than any now to be found in New England. The owners, not being aware of the value of these trees from the maple-sugar standpoint, had begun cutting them down for lumber at an average return of less than \$1 a tree. At the suggestion of the Federal representative the groves were spared further cutting in many instances and the owners last year began tapping the trees and making sirup that sold for \$4 a gallon. This revelation of the potential value of these groves has induced the owners to plan more extensive operations for this coming spring, so that instead of destroying the groves they will become a source of permanent and larger in-

come. It is expected that the flow of sap will be even more satisfactory than last year, since the warm weather of last winter was not favorable to producing the best grade nor the highest yield of sugar and sirup.

The maple sirup and sugar industry is distinctively American and offers good commercial opportunities for those who engage in it systematically. No countries besides the United States and Canada produce this much-prized product on a commercial scale, which is at once a delicacy and a highly nutritious article of diet. The demand for both sirup and sugar is far beyond the supply.

Because the sugar content of the sap varies from time to time, uniformity of quality can not be secured throughout a season. Warm days and cool nights are essential to a satisfactory flow, and the sugar content may vary considerably from day to day. However, this is not a feature that materially affects the success of one's operations.

Tapping of sugar trees if done properly in no way injures the tree. Trees have been tapped for more than 100 years and are still in good condition.

It is a good policy to tap early in the season to obtain the earlier runs, which are generally the sweetest, and therefore the best producers. Makers have lost half and even more of their crops by not being prepared for the first run. In general, it may be said that the season is ready to open during the first or middle of February in the southern section and later in the northern regions when days are becoming warm—when the temperature goes above freezing during the day and at night below freezing. If the days are very bright, warm, and sunny the sap will start with a rush but soon slacken, or if a high wind starts the flow is checked. Protracted warm weather or a heavy freeze with nights and days of even temperature stops the flow altogether, to start again when weather conditions are right.

Considerable difference of opinion exists as to the best method of tapping a tree. A thirteen thirty-seconds of an inch ($13/32$ -inch) bit is often used. Its direction should be slightly upward into the tree, the slant allowing the hole to drain readily. With an ordinary tree the hole should not be over $1\frac{1}{2}$ to 2 inches deep at best.

The equipment required for sirup and sugar making does not necessarily represent a large outlay. A number of sap spouts, either wooden or metal, are needed. The sirup is usually gathered in buckets and, if the grove covers a considerable area, a wagon or sled is used to carry barrels into which the buckets are emptied. For a small grove a big iron kettle, such as most farmers possess, is ample for boiling the sap over an out-door fire. For large production a more elaborate equipment, such as a pair of pans set over a brick framework of various patent evaporators may be employed. Where a sirup is made as a side issue or in small quantities it is customary to make the extra concentration essential to producing sugar in pots over the kitchen stove, but where

made on a large scale home-made or factory-made apparatus can be employed.

While the possibilities of immediate returns from maple trees now standing are of chief interest at this time, the United States Department of Agriculture experts call attention to the large commercial possibilities in maple-sirup production which could be developed in a comparatively few years by extensive planting. There are large numbers of tracts now unfruited and considered almost worthless but well suited to growing maple trees. These tracts are to be found throughout the regions referred to above, and could be planted to sugar maples at small cost.

VALUE OF SHADE TREES

BY C. F. BLEY

MR. T. E. Snyder, of the office of Forest Entomology, United States Department of Agriculture, is at present conducting an investigation to ascertain the number and value of shade trees throughout the country, according to an announcement in the September issue of *AMERICAN FORESTRY*.

Mr. Lanham, of the City Park Department of Washington, writes that the value of a shade tree is difficult to determine, but adds that, "often five hundred to a thousand dollars more is charged for a real estate lot with, than for an adjacent lot without, trees."

All observing, intelligent persons have—though they cannot express it in dollars and cents—an abstract conception of the value of a shade tree.

A plan is under way, and is receiving the hearty indorsement of highest authorities in the country, to plant systematically to forest—shade—trees, all the roadsides in the United States.

The trees so planted, 50 feet apart on either side of the 246,000 approximate miles of public roads, outside of incorporated towns and cities, would, when grown or matured, equal or represent a forest limit of more than 9½ million acres, based on a calculation of 55 trees 10 inches in diameter per acre of virgin forest.

From a standpoint of climatic influence alone then the consummation of such a project would be of inestimable value. But add to the climatic effect the aesthetic or landscape beauty and the comfort-giving features, and we can picture results that are beyond human calculation.

Our ancestors, the pioneers of the country, planted forest or shade trees when there was scarcely an argument for their planting—when they were hemmed in and surrounded by virgin forest. Today we are enjoying the fruits of their devotion, wisdom and forethought. Shall we do less—when there is so much more need—for the rising generations and for those yet unborn?

Not every husbandman has appreciated the value of shade trees, witness the ruthless cutting down and making into cord wood of whole lines of noble, stalwart sugar maples!

A legal enactment in every state providing that every tree now or hereafter standing within the legal road

boundary shall be considered public property suggests immediate steps to so legislate.

THE State of Massachusetts, under its new Forest Act, will acquire 100,000 acres of forest land for state forest purposes. The new act is a substitute for one presented by the Massachusetts Forestry Association which was based on an initiative petition signed by over 31,000 voters.

A LIGHTNING fire on August 4 of this year started over 230 fires in the National Forests of California. Lightning fires have probably occurred in greater number throughout the Northwest than in any previous year of record. More adequate fire protection is urgently needed.

SERBIAN TREES DEMANDED FOR FUEL



This photograph of a group of Serbian farms shows the curious and inartistic method of conservation practiced by the farmers of that country. In order to make the most of their scanty wood supply, the peasants yearly denude each fuel-bearing tree of every branch and twig. The rigors of the past winter caused the shortage to be acutely felt, and sent many patients this spring to the American Red Cross hospitals established throughout Serbia.

"He that planteth a tree is the servant of God.

He provideth a kindness for many generations,
And faces that he hath not seen shall bless him."

—Henry Van Dyke.

HIGH PRAISE GIVEN ASSOCIATION

PUBLIC opinion as mirrored in the editorial columns of the press of the country is solidly behind the campaign for a national forest policy and for better fire protection of the forests. The editors, following the statement of the Association that the next President will be a newspaper publisher, commented widely on that fact. Now the editorial comment continues from one end of the country to the other. The *Chicago Tribune* editorial, which was used on the front cover in November, has been reprinted by scores of papers. Warren G. Harding, the President-elect, has voiced his approval of the need of a national forest policy and his speech on this subject prompted additional editorial comment.

A resume of this expression of opinion, which extends from coast to coast follows:

Clinton (Ia.) Advertiser: The American Forestry Association deserves high praise for its efforts to arouse Congress and the American people to the importance of a national forest policy.

Statistics show we are consuming lumber three times as fast as we are producing it, and it is predicted our saw log lumber will have disappeared in fifty years.

The bulk of the original supplies of yellow pine in the South will be gone in ten years and within seven years 3,000 manufacturing plants will go out of existence. White pine in the Lake States is nearing exhaustion and these States are paying \$6,000,000 a year in freight bills to import timber. New England, self-supporting in lumber twenty years ago, now has to import one-third of the amount used. It has \$300,000,000 invested in wood and forest industries, employing over 90,000 wage earners. Fire destroys over \$20,000,000 worth of timber every year and kills the reproduction upon thousands of acres of forest lands. Within fifty years our present timber shortage will have become a blighting timber famine.

There is a remedy. Forests may be protected from fire, regrowth can be encouraged, conservation can be practiced, reforestation can be accomplished, though it takes from 50 to 100 years to mature a timber crop.

Forests devastation must be stopped, and lands now in forests must be kept continuously productive. Forest lands now devastated and idle must be put to work.

The American Forestry Association, pioneer in the national movement for rehabilitation, is working successfully to these ends.

Anaconda Standard: While several forest fires are raging in Idaho and Montana, the question of lumber stocks and lumber prices jumps into the front row of leading

ANOTHER REASON FOR HIGH LUMBER COSTS

First reports of an analysis of American freight traffic on railroads, begun this year by the Interstate Commerce Commission show that during the first quarter of 1920 railroads moved 80,087,435 carloads of freight, aggregating 275,931,603 tons. Statistics were presented to show the quantity of each of 69 separate commodities entering into the composite total of merchandise moved in less than carload lots.

Bituminous coal, of which 1,866,632 cars were moved, was by far the leader in the list of bulk commodities reported. Forest products were next in utilizing railroad facilities, with 452,559 carloads of lumber and timber and 341,687 cars of logs, poles and cordwood.—Olympia (Wash.) Recorder.

topics. The American Forestry Association calls upon the people to urge the promulgation of a national forest policy and the *FORESTRY Magazine* discusses lumber from

A LAUGH FROM "LIFE"

The American Forestry Association has asked the people of the United States to select, by popular vote, a suitable national tree.

We venture to suggest that some of the votes will be cast as follows:

The Bolshevik will vote for the redwood.

The amateur distiller for the juniper.

The severe school teacher for the birch.

The chronic Brooklynite for the rubber plant.

The bathing girl for the beech.

The baseball player for the willow.

The lady of fashion for the fir.

The susceptible youth for the peach.

The poker player for the pear.

The bellboy for the palm.

The railroad employe for the plum.

The professional humorist for the chestnut.—Life (N. Y.).

the viewpoint of the manufacturer. Prices have been soaring and timber resources dwindling. It is a serious condition, according to this authority.

Newark Star: There are more than 50,000 wood-using plants in the United States having an invested capital of over a billion dollars and employing more than a million persons. All alike are suffering from the diminishing supply of timber, yet

obvious remedies, such as reforestation, conservation of existing supplies and fire prevention are not applied.

Sumpter (S. C.) Item: The American Paper and Wood Pulp Association, at its recent convention in New York, adopted a comprehensive program for replenishing the paper mills' raw material supply. It is a scheme of reforestation, to be made into a national policy and put through by the federal government, with the co-operation of the States.

There would be fixed sums appropriated annually for forest surveys, the purchase of timbered land and land suitable for timber, and for planting new trees. The process would go on until the national forests aggregated 200,000,000 acres. The States would be expected to provide better protection for forest lands. Private forestation would be encouraged, and farm loans would be made available to promote timber-growing.

These recommendations are no doubt good ones, deserving careful consideration by Congress and the State legislatures. They need not be allowed, however, to divert attention from an important fact emphasized at the convention by George W. Sisson, president of the Association. He admitted frankly that the present paper shortage, which is of such vital concern to every publisher in America, and indirectly to every citizen, is due directly to the prodigal methods used in American forests and paper mills.

Toledo Blade: Paper mills are no longer close to supplies of wood pulp. Lumber comes over the rails now to practically every mill and the haul is constantly getting longer.

The New England and Great Lake States, once self-supporting in a lumber way, import material to keep their wood-using industries alive, and the South's supply of virgin pine will be exhausted in fifteen years, it is estimated. The center of the lumber industry is moving rapidly to the Pacific Coast and this means longer hauls, higher freight charges and consequently higher prices for articles made of wood. In the face of these facts timber wastage in the United States by preventable fires is estimated at \$28,000,000 a year and reforestation is carried on only haphazardly.

Tacoma Daily Ledger: So often has this story of forest depletion been told, and retold, that the public is gradually recognizing the economic danger in our disappearing forests and considering the need of conservation and of a constant replenishment of the supply of timber. The awaken-

FOR CAMPAIGN FOR FOREST POLICY

ing is belated. Even under the best forestry it takes from 50 to 100 years to mature a timber crop. If the American people half a century ago had recognized the need of conservation and replenishment as they do now, and had united in forwarding an efficient plan constantly to provide new timber, there would now be no cause to fear a prospective lumber and paper famine in the nation.

But the country did not look ahead. The consumption of lumber is more than three times its growth, advises the American Forestry Association. The prediction is that saw lumber will be gone in 50 years except out here in the Northwest. Only one-fifth of the nation's original forests remain. The bulk of that is in the Pacific Northwest.

According to compilations announced this week by the District Forest Service at Portland there is left 30,475,000 acres of commercial timber in the private and national forests of Washington and Oregon. It is estimated that Washington State alone is cutting between 5,000,000,000 and 6,000,000,000 feet annually. Of the total area of standing timber in the two States, 15,047,000 acres is under private ownership and 15,428,000 acres under federal control. This stand of merchantable timber represents 745,000,000,000 feet. The original forest area of both States was 48,000,000 acres, with 4,330,000 acres having been logged-off and 7,500,000 acres destroyed by fire. The annual area being cut over at present is estimated at 260,000 acres. The American Forestry Association is urging federal and State legislation and the co-operation of timber owners, wood-using industries and individuals to assure ample timber land in the future. The economic welfare of the nation requires better protection of our forests and the reforestation of devastated timber land.

Spokane Spokesman-Review: American forests are destroyed four times faster than new forests are grown. This is not the statement of an alarmist or amateur. It is the measured declaration of that responsible and official organization known as the Forest Service of the United States.

Nor is that statement the worst feature of the timber situation. The foresters add that saw timber, the most needed and most

valuable part of the standing timber, is cut five and a half times as rapidly as it grows. The price of lumber, therefore, has risen far out of proportion to the general increase of prices; and yet this increase has itself been enormous.

The situation has come home to every American. The manufacturer, the farmer and the builder feel the shortage and expensiveness of lumber. The shortage of houses throughout the country is mainly owing to the scarceness and the extreme cost of lumber, laths and shingles. The scantness in the supply of woodpulp is felt in the price of books, periodicals, paper

to supply the nation for centuries. Foresight and care will finally cause lumber to become a comparatively cheap article again. But waste lands must be planted and tended scientifically. Private owners must be made to understand that their forests are not bonanzas to be exploited and abandoned, but properties that can and should be made to yield yearly dividends forever.

The great forests that are gone can not be replaced. But conservation of those that exist and planting forests on undeveloped areas can assure us of a permanent if restricted supply in the future.

SEEMINGLY UNIMPORTANT, BUT DANGEROUS ENEMIES



Portland Telegram.

Marinette Eagle-Star: With smoke from nearby forest fires blowing across the country and enveloping everything like a heavy fog, we are brought face to face with the realization that the protection against destruction of the timber which is still standing, is far from adequate.

Much of the timber is owned by large companies which can better afford to stand the annual losses from fire, than could the individual who occasionally suffers losses from this source, yet with every foot of timber that is destroyed, comes an additional cost to that which is manufactured into lumber for various purposes, and the ultimate consumer, as in all other cases, is the one who pays for that waste which should have been avoided by adequate fire protection to our forests.

And not only does the burned timber add to the cost of lumber which is bought by the ultimate consumer, but this same waste causes an additional amount to be counted in with the total through the law of supply and demand. Each year, our forests are hacked and burned away, many times faster than they are being grown. With little thought of the future, this process continues year after year.

Reforestation and timber conservation are subjects discussed to some extent but never acted upon. It would seem that eventually some definite line of action looking to the accomplishment of these purposes would be adopted by the government. We still have time to prevent a timber famine, although we are many years behind in the work. It is high time to outline a policy of reforestation and timber conservation.

wrappers and cardboard containers. Lumber, instead of becoming cheaper, is likely to cost yet more in the future. The price of every product made from wood is destined, unless drastic measures be taken to correct the ratio between cutting and the growth of timber, to advance still more sharply.

Our predicament does not result from lack of resources. Outside of private forests and of public reserves where timbering is prohibited there exist 80,000,000 acres available for reforestation. An even larger area is partly productive, but is devastated annually by fire. The areas capable of yielding timber are abundant enough, if only forestry and conservation be practiced,

FORESTRY IN INDIANA

INDIANA, once possessed of many million acres of native hardwood forests unsurpassed in size, quality, fineness of grain and so abundant that the state for years was the scene of great timber exploitation, today is paying the penalty for an era of extreme disregard of the future, while this generation finds itself confronted by an inadequate timber supply, according to Richard Lieber, Director of Conservation in the Hoosier State. Mr. Lieber is directing a survey of the natural resources of Indiana to be presented to the State Legislature at its meeting in January when his department will seek legislation to reforest the state. The Department's program will ask the state to purchase thousands of acres of waste and eroded hill land and plant them to forests.

Reckless despoliation and extravagant waste of one of our greatest native assets is causing conservationists to look with apprehension on the lack of timber for present and future needs, Mr. Lieber says. Generations to come, when they learn of our reckless prodigality of this great resource, will criticise us severely for such indifference.

It was but natural that the civilization of a hundred years ago should make war upon the primeval forests of Indiana along with its inhabitants, the Indian and wild animals. That this civilization has dominated is seen on every hand. But the forces of nature have self-asserting laws that can not be evaded or reversed by man. We have been profligate with one of nature's greatest blessings—our forests, and today we are paying the penalty. Our atonement and restitution must come through a concerted policy of replacing as far as our means will permit, this natural heritage that is in grave danger of complete extinction.

Since time was reckoned forests have served different races of people in different periods in different and varying measures. History tells us that forests gave our aboreal ancestor all his food and practically all his shelter. The American Indian is the first race of man of whose mode of living we have an accurate knowledge. The forests directly or indirectly gave the Indian within the Territory of Indiana his sanctuary and sustenance.

The profound influence of the forest on this race of people is seen in their idea of immortality. Their conception of the Great Beyond was a well stocked forest which they called "The Happy Hunting Ground."

When the European came to Indiana he found heavy, luxuriant and gigantic forest trees. It was necessary for him to have cleared fields; so he deadened great forest areas, which as soon as they were dry enough to burn, were felled and destroyed. The forests provided timber for block houses, stockade, log stable, rails for his fences and his fuel, but these requirements had no appreciable effect in diminishing the forest area. It was when the first railroads were extended into Indiana from the East, that a new epoch of forest destruction began. The rail arteries opened a new field of enterprise—the marketing of timber in Eastern states and in European

countries, and shortly Indiana's wonderful forest resources become known to the world.

Lumber companies, inspired only by enthusiasm and too often greed which knew no bounds, attacked the primeval forests, each in a mad race to strip its territory and market its timber first; then to move forward and continue the destruction. Much of that which escaped the timber crews fell victim to forest fires which denuded and left bleak, barren and blackened, thousands of scorched acres, and swept away in flame and smoke, millions of dollars' worth of property.

So attacked on one side by commercial interests inflamed to frenzy in an effort to produce more and ever more board feet of lumber, and on the other side by conflagrations often directly due to carelessness, the once great hardwood forests of Indiana, which gave the state the proud position of a leader in timber production in the Union, have dwindled until today there remains but a remnant of the former formidable possessions.

Today there are thousands of acres of cleared land in Southern Indiana which are not now farmed because they have washed or eroded so that they cannot be farmed or are too unprofitable for agriculture. They are growing up in poverty grass, weeds, briars, sassafras, persimmon, etc. The State Forester tells us that all such land will not grow a permanent and profitable agricultural crop, that it is essential forest land and should never have been used for any other purpose than growing trees.

Among the forest influences which should be considered are the effects of the removal of forest cover in causing irregularity of stream flow due to the drying up of streams and springs, together with the resultant destructive floods. Some eminent authorities say the stopping of floods is an engineering problem but that forests can be depended upon to render the flow of water throughout the year more uniform. Another marked result of deforestation is the lowering of the water table as a result of drying up of springs and streams. Ground water has been lowered from two to twelve feet below its former level in some sections of Indiana as a result of deforestation.

Forestry is a new science in America and nowhere in this country is there greater need of adoption of its teachings than in Indiana. Nowhere are the conditions for a broad forest policy more favorable. In Wisconsin for instance, where depleted forest conditions are similar to the era of destruction prevalent in Indiana, the Wisconsin Legislature appointed a Conservation Board whose labor is characterized by a continuous, constant and progressive forest policy. Not only were adequate powers given this board by statute, but ample appropriations were made to insure their successful exercise.

When it is once thoroughly understood that scientific forestry does not mean the withholding of valuable agricultural soil, but only the retention for timber of such lands as are less profitable for other purposes, it is logical to believe that a concerted effort will be made in the United States to replenish a great natural resource that is nearly exhausted because of reckless squandering and the theory that forest products were illimitable.

FOREST SCHOOL NOTES

UNIVERSITY OF CALIFORNIA

THE Forestry Division has entertained several interesting visiting foresters during recent weeks. Mr. A. Helms, of the New South Wales, Australia Forest Service, is in this country in search of a satisfactory conifer for planting in Australia where softwoods are very scarce and expensive. He plans to experiment with western yellow pine, Douglas fir and possibly one or two of the southern pines, and emphasizes the need for care in getting seed from a locality whose climatic characteristics are as nearly like those of the proposed planting area as possible. Professor P. Leslie, head of the forest school at Aberdeen University, Scotland, stopped. He came here through Canada and down the Coast, stopping at Seattle and Portland and talked entertainingly of his trip and impressions. Two distinguished Japanese foresters have also visited in Berkeley recently. Dr. Hisachi Mochizuki, For-

est Expert of the Bureau of Forestry, Japan, is making a study of American lumber and forest products, while Dr. Ichiro Sonobe, who teaches forest administration and economics at Tokyo Imperial University is making a six months' trip in the United States to study logging conditions and important Pacific Coast timber species such as redwood, sugar and western yellow pines, and Douglas fir. He said that their forest school owns and administers school forests to the extent of 160,000 hectares, requiring an administrative force of eighty supervisors and rangers and producing an annual gross revenue of about \$150,000. Some of our American Forest School forests seem pretty small in comparison. He stated that white pine, northern white cedar and Douglas fir make the best growth of any American timber species under Japanese conditions.

Professor Donald Bruce attended the Pacific Logging Congress meetings in Spo-

kane the first week in December, as did Professor D. T. Mason, who is to resume his duties at Berkeley in January, after an absence in Washington of nearly two years.

UNIVERSITY OF IDAHO FOREST RANGER COURSE

THE Ranger Course in Forestry offered by the School of Forestry of the University of Idaho opened for the first term of the 1920-1921 season on November 1 with a registration twenty-five per cent larger than the previous record. The popularity of this course is indicated by the fact that students were drawn from many of the far eastern and lake states as well as from the west, there being representatives from New York, New Jersey, Pennsylvania, Illinois, Minnesota and California, as well as Idaho.

The practical work of this course is well under way, as in addition to the lecture and

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laboratory work, several trips for practical field demonstration have been made to the forest on Moscow Mountain. The work is so arranged that new students who are unable to attend the full five months over which the course extends may enter for the second term which opens on January 3, and get three months of profitable instruction.

MADISON OFFERS COURSE IN BOXING AND CRATING

THERE is a daily loss to shippers and manufacturers conservatively estimated at \$500,000 due to poor packing and expensive and improperly designed containers for all classes of domestic and foreign shipments, says a bulletin from the United States Forest Products Laboratory.

An efficient container must deliver its contents in a satisfactory condition at a minimum cost. Commercial research and mechanical tests at the Forest Products Laboratory on better containers began in 1915 in co-operation with the National Association of Box Manufacturers, and the National Cannery and National Wholesale Grocers' Associations. In this work methods and testing equipment which have become standard for the box industry were developed.

The War Department prepared general specifications for overseas shipments from the data accumulated by the laboratory.

The laboratory has co-operated with associations and companies in improving the packing of widely varying types of commodities. These tests and studies, in many cases, resulted in the redesign of the container. The new design gave increased strength and often decreased the amount of material used in its manufacture; gave security against pilfering; decreased the cubic contents; reduced the labor and cost of manufacture; made possible more rapid production of packages; decreased cost of ocean freight, and permitted improved methods of handling freight. This work is of value to all manufacturers, shippers and dealers, and to the public at large, which is vitally concerned in receiving its necessary commodities in satisfactory and economical containers.

The demand upon the laboratory for information suggested a series of co-operative training classes for men from various industries. The course lasts five and one-half working days. Reference material and condensed notes are given out and it is necessary for those attending to devote a portion of each evening to study. A series of lectures on kiln drying, glues, fibre board and box woods is given. One subject is studied each day.

The object of this course is to demonstrate for manufacturers and packers the principles that underlie proper box and crate construction and develop economical containers that will deliver the contents to its destination in a satisfactory condition at a minimum cost.

The course is given in the most com-

pletely equipped box laboratory in the country. For a long time this box testing laboratory was the only one in the world, but within the last year the laboratory has aided in planning several commercial laboratories.

Dates for the next three courses are: January 10-15, 1921; March 7-12, 1921; May 2-7, 1921.

All correspondence should be addressed to the Director, Forest Products Laboratory, Madison, Wisconsin.

MICHIGAN AGRICULTURAL COLLEGE

THE Forestry Department has completed a set of volume tables for sugar maple in the northern part of the State. These tables are the result of many years' work and much data collected by the students at the forestry summer school which has been held in various places in northern Michigan. Volume tables on basswood, beech, elm and hemlock are in course of preparation as also growth tables for second growth sugar maple.

A fire caused by a locomotive burned over about ten acres in one of the College woodlots this fall. It necessitated trenching to confine it. The woods were very dry this year. During these dry weeks the College maintained a day and night patrol of the woods in the forest nursery. The College forest in Iosco and Alcona counties containing fifty thousand acres of Jack pine plains escaped fire. This land adjoins the Michigan National Forests and it contains scattered stands of Jack pine and oak.

The Forestry Club held its annual camp-fire on November 3; about sixty students being present. The Forestry Club is one of the strongest technical clubs at the College.

NEW YORK STATE COLLEGE OF FORESTRY

NOTABLE forestry demonstration projects for 1921 under the supervision of the New York State College of Forestry at Syracuse are already under way, and more demonstrations are being added each month as part of the 1921 program. The policy of the college of educating the State through practical demonstration plantings will be continued next year on an even larger scale than last spring, when nineteen demonstration plantings were made in nine counties, with a total planting of 300,000 trees. Among the important tasks already being laid out are the following:

The reforestation of the city water reservoir region at Yonkers.

The preservation of the watershed at Peekskill, from which the city derives its water supply.

Planting of probably 50,000 trees at least, for the Broome County Sportsmen's club, which plans to establish a great forest system in the southern New York hills.

The extension of the Dozen Dads Forest at Cooperstown into other parts of Otsego County.

Additional municipal forest plantings in northern New York, including more planting at Malone, where the college supervised the planting of 45,000 trees last spring.

Many planting jobs on a smaller scale are being projected, and present indications, months in advance of any possible planting, indicate that all records will be broken for the year's work.

ENGLAND NEEDS FOREST SCHOOL

A NOTABLE authority on empire forestry and a delegate to the British Empire Forestry Conference, Mr. H. MacKay, has recently left England on his return journey to Australia which country he represented with Mr. Lane Poole, says the *Christian Science Monitor*. Mr. MacKay has served on many Parliamentary Committees and Royal Commissions, and was associated with the Australian delegation at Ottawa in 1894, the first conference on preferential trade between Great Britain, Canada and Australia. He prepared all reports, and framed all forestry legislation for the Victorian Parliament from 1907 to 1919 in which year he was appointed commissioner of forests for Victoria.

In expressing his views upon education in forestry Mr. MacKay said that at present there is no great forest school worthy of the name in the empire, such as those established for the training of foresters at Nancy in France and at Munich, Tharandt and Eberswalde in Germany.

There is indeed a useful school for intermediate training at Detirra Dure in northern India, and also schools for the lower grades of the forest service in Australia, South Africa and Canada, but hitherto no school has been founded fit to impart a thorough practical and theoretical training to students to fit them for the higher executive posts in any part of the empire. The training now given at Oxford, Cambridge and Edinburgh Universities to candidates for the Indian forest service is adapted to the needs of that empire alone, and in any case students in the past have had to get an insight into practical work in the forests of France and Germany.

It is high time that this reproach should be removed, and the recent conference, in deciding to urge that a forestry training institution, well equipped from the beginning and properly staffed with a corps of competent teachers should be established without delay in England, believe that the project will command whole-hearted support throughout the empire. In any case such an institution is essential to meet the needs of forestry in the United Kingdom and British India, but most of the self-governing colonies are sadly in need of properly trained young men to take up executive work in their forests, and this central training school if properly organized will enable them to send to England for training the brightest and most promising pupils from their own elementary schools.

BOOKS ON FORESTRY

AMERICAN FORESTRY will publish each month, for the benefit of those who wish books on forestry, a list of titles, authors and prices of such books. These may be ordered through the American Forestry Association, Washington, D. C. Prices are by mail or express prepaid.

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THE PRESERVATION OF STRUCTURAL TIMBER—Howard F. Weiss.....	3.50
THE UNITED STATES FOREST POLICY—By John Ise.....	5.15
THE KILN DRYING OF LUMBER—By Harry D. Tiemann.....	4.65
MODERN PULP AND PAPER MAKING—By G. S. Witham, Sr.....	6.15

* This, of course, is not a complete list, but we shall be glad to add to it any books on forestry or related subjects upon request.—EDITOR.

CALIFORNIA AIRPLANE FIRE PATROL SUCCEEDS

THIRTY-THREE per cent of the 196 forest fires discovered and reported by that part of the Ninth Aero Squadron operating out of Mather Field this year were accurately located, according to word sent out by the Forest Service.

"And 'accurately' in this case means that these locations, given us by the Airplane Fire Patrol, were all within one-fourth mile of the exact location as later determined by actual surveys on the ground," says District Forester Paul G. Redington.

"This record, when supplemented by the further facts that an additional 19 per cent of the fires discovered were reported within one-half mile of their actual locations; that 10 per cent of the total number were discovered by the Air Patrol before the rangers knew they existed, even; and that 42 per cent, or 83, of the fires were reported by radio while the ships were in flight, demonstrates beyond doubt that Airplane Fire Patrol in California has been successful," he continued.

Besides acting as lookouts to detect and report fires, airplanes were used this year to direct fire fighting operations, and to patrol fire lines which had been built but which needed watching to see that the flames did not get beyond control, according to forest officers. The case of the Mill Creek forest fire on the Lassen National Forest, where 25,000 acres were burned over, is cited as an example. "Here," according to the statement issued, "a special reconnaissance plane, equipped with radio and with a forest officer for observer hovered over the fire and actually directed the movements of bodies of fire fighters by wireless messages received right on the fire line. In addition, this plane patrolled, twice each day, some 14 miles of completed fire-line from which all men had been removed. If reports from the air showed the line to be clear, the fire fighters were kept at work elsewhere; but if the observer wirelessly in that the fire had broken away, then a force of men was rushed to the spot and the fire corralled again."

Since June first, two planes have been operating on fire patrol daily from Mather Field, two from Fresno, two from March Field, and three from Red Bluff. The air patrol has been in addition to the regular Forest Service lookouts maintained each summer for the last ten years on nearly 100 of the higher peaks in the National Forests.

ON ACCOUNT OF THE UNUSUAL DEMAND FOR THE EARLY ISSUES OF THIS YEAR'S MAGAZINE, YOUR ASSOCIATION WOULD APPRECIATE BACK COPIES OF 1920 NUMBERS FOR PURPOSES OF BINDING AND REFERENCE USE. PLEASE SEND THEM TO 1214 SIXTEENTH STREET, NORTHWEST, WASHINGTON, D. C.



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**SUPPLYING THE NATION WITH
CHRISTMAS TREES**

THE United States uses annually between four and five million Christmas trees, according to the estimate of the Forest Service, United States Department of Agriculture. This equals approximately the combined consumption of England, Scotland, and Wales and is about 25 per cent greater than that of Germany. The Christmas tree bears practically the same fruit the country over, but the variety of the tree itself varies according to locality. The fir is undoubtedly the Christmas tree par excellence, especially in the Northeastern and Lake States, on account of its long horizontal spreading, springy branches, and deep-green, fragrant foliage which persists longer than that of any other evergreen.

On the Great Lakes "the Christmas tree ship" bringing greenery from the upper peninsula of Michigan to Chicago or Detroit is usually one of the latest events in navigation each winter. In the North eastern and Lake States Balsam fir furnishes the bulk of the Christmas tree trade. In the South the Fraser fir is the favorite. In Colorado and other Rocky Mountain States, fir, though abundant, is difficult of access and the lodge pole pine and occasionally the Douglas fir and Englemann spruce are used. On the Pacific Coast the Christmas tree is often the white fir. Spruces vie with firs in popularity as Christmas trees, but as a rule in the South

and West they occur at high altitudes which makes them difficult to get.

New York and the New England States consume 1,500,000 trees. Black and red spruce are very commonly seen in New England Christmas celebrations and in New York and Philadelphia. Throughout Illinois and Ohio nurserymen partly supply the local demand with nursery-grown Norway spruce. Pines are in great demand for Christmas trees when fir and spruce are not available. Throughout Maryland, Virginia, and in Washington, D. C., the scrub pine finds a way into many homes, while in southern Wyoming the lodge pole pine is almost the only species available.

Hemlock is often used but only in the absence of other varieties. Its slender, springy branches are better adapted to the manufacture of so-called fancy greens. Occasionally a few arborvitae are shipped among firs and spruces to New York and Philadelphia. Red cedar is not despised where better trees can not be had as in the treeless States and often in Tennessee and Pennsylvania. In California red cedar and incense cedar are not uncommon.

Maine, New Hampshire, Vermont, the Berkshire Hills in Massachusetts, and the Adirondacks and Catskills in New York are the sources of supply for New York, Philadelphia, and Boston, and even for Baltimore and Washington. The swamps of Michigan, Wisconsin, and Minnesota furnish the markets of Chicago, St. Paul, Minneapolis, and the cities of the Plains States.

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FIRE WARDENS MEET

THE meeting of Pennsylvania Fire Wardens at Moshannon Bridge, as the guests of the Central Pennsylvania Forest Fire Protective Association, was by far the best meeting ever held in that section of the state and was attended by more than fifty wardens, besides others interested in forest fire work, and from the interest displayed it is clear that a greater interest is being taken in this much neglected work.

Talks were given by a great many of those present, including foresters, wardens and others on methods of forest fire control, and how to best get the support of communities in the work.

There were veterans of three wars at the meeting, but a remarkable incident was the presence of two Civil War veterans, both members of the 45th Pennsylvania Volunteer Regiment and both active volunteers in forest fire work: Captain C. T. Fryberger and Mr. David Litz, of Philipsburg and Houtzdale.

The greatest single contribution to the success of the meeting, was the dinner served by Mr. R. D. Tonkin, Forester of the Clearfield Bituminous Coal Corporation, at their lumber camp. The dinner was served in lumber camp style, quality and quantity.

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TEXAS SHOULD PRACTICE FORESTRY

WE have now in mind the future health, wealth and climate of Texas, as affected by their woodland. The wooded area of Texas exceeded that of any other State, but has now shrunk to a mere outline, says W. Goodrich Jones, president of the Texas Forestry Association. The average citizen will not read an appeal for the conservation of our trees and has sublime faith in his ignorance. Many proclaim, with the utmost faith, that the Lord will provide a future timber crop when the present stand of trees is gone.

It is slowly dawning on some people of this State that there is no perpetual regeneration among our birds, fish and wild game. Nearly every State in the Union has hatcheries for fish. We should have no Columbia River salmon, no lobsters, no oysters, no mountain river trout, but for protection. All Europe and Asia show that droughts, floods and famine follow the destruction of the timber land.

Even today Texas is suffering from droughts, floods, mud-choked rivers, overflowed bottoms, bars and shallowing harbors, and the best lands on the farms washing away. Ten million acres once in pine and another 10,000,000 in other woods. Gone is the mesquite, cedar, and going into smoke are the hard woods in our river bottoms. Gone to Kansas and Nebraska and other States, as well as to Europe, is a large part of the pine product of Texas, until today we barely have left 2,500,000 acres of virgin pine.

On 6,000,000 acres of cut-over timber land in Texas, ill fitted for first-class farming, while best fitted for another timber crop, less than 1,000,000 acres are struggling with a new growth of pine. Why are the other 5,000,000 acres idle? The answer is, fire, hogs and lack of seed. Will not this 1,000,000 acres supply our needs for a future lumber supply? Decidedly no.

The virgin forests have taken 100 years to grow. It will take at least 6,000,000 acres of new forests and fifty years to supply Texas with its future lumber needs, even then exercising great economy. This means no waste and no growth in population. We can not defer our planting another ten years, when we shall have reached the brink. If we do, we may then be compelled to build our homes of Mexican adobe mud and poles. Lumber is high enough now. Think what it will be when brought from the Pacific Coast with added freight. Even now the shipment of Oregon lumber has begun to compete with Texas pine. Do not look for relief to Louisiana and other Southern States. They, too, are singing the swan song to their forests. We here in Texas need home-building lumber, bridge timber, fuel, fence posts, ties, paper stock and a thousand other uses for timber.

The war could not have been won without the artificially planted forests of France. There is no harm in cutting the timber if another crop is grown, but to cut and waste the trees, fire annually the fallow soil and young tree growth, is the work of fools or mad men.

The present timber land owner can not afford to and will not grow a future timber crop for Texas. This problem lies with the citizenship of the State. Louisiana has found a solution for this question and has started on the remedy. We want our Legislature to adopt it for Texas also.

REFORESTATION IN MAINE

TREES require only one-quarter the salts and other chemicals which garden crops require and they can be grown on steep slopes otherwise difficult to till, says a member of the Faculty of Forestry at Bates College, Maine. Therefore he believes that Maine has a wonderful opportunity to develop her forests, for the land is naturally hilly and rocky in many places and on such lands lumber would net larger returns than the meager crops which could be raised. Practical work in forestry in the several thousand acres in York County held by Bates College will be offered students for preparation for graduate schools for forestry, and to fit them to take positions in the lumber industry, or in the state forestry service.

PAPER COMPANY SETS GOOD EXAMPLE

THE following is taken from a letter from a member of the American Forestry Association, Mr. John Weeks, of Watertown, New York:

"I am vice-president of the Diana Paper Company which has its own nursery and has planted trees for the last twelve years. With the timber lands purchased fourteen years ago in the Adirondacks on which we have never cut a tree, we will be able in a few years to be self-sustaining. This may be news to the Association. Last year, on account of the difficulties of getting labor, we were unable to set out our usual allotment, but our trees are doing fine and we have already many twenty feet high." This is a practical policy greatly to be commended on the part of the paper company.

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PLANT MEMORIAL TREES

101,000,000 FEET National Forest Timber FOR SALE

Location and Amount—All the merchantable dead timber standing or down and all the live timber marked or designated for cutting on the Lava Bed Logging Chance, embracing about 6,100 acres in Townships 41 and 42 N., R. 3 E., M. D. M., Shasta National Forest, California, estimated to be 80,000,000 feet B. M. of yellow pine, 9,000,000 feet B. M. of sugar pine, 10,400,000 feet B. M. of white and Douglas fir, and 1,800,000 feet B. M., of incense cedar, a total of 101,200,000 feet B. M. of saw timber, more or less. The chance also embraces the timber on about 800 acres in Townships 41 and 42 N., R. 3 E., M. D. M., estimated to be 12,000,000 feet B. M., more or less, all species, the cutting of all or any part of which will be at the option of the purchaser, subject to the approval of the forest supervisor.

Stumpage Prices—Lowest rates considered, \$4.00 per M ft. B. M. for yellow pine, \$4.50 per M ft. B. M. for sugar pine, \$1.25 per M ft. B. M. for white and Douglas fir and incense cedar, and for material unmerchantable under the terms of the contract, to be removed at the option of the purchaser, for which payment is required by the Forest Service, \$0.50 per M ft. B. M. Rates to be readjusted July 1, 1924.

Deposit—Ten thousand (\$10,000.00) dollars must be deposited with each bid to be applied to the purchase price, refunded, or retained in part as liquidated damages, according to conditions of sale.

Final Date for Bids—Sealed bids will be received by the District forester, San Francisco, California, up to and including March 1, 1921. The right to reject any and all bids is reserved. Before bids are submitted, full information concerning the character of the timber, conditions of sale, deposits, and the submission of bids should be obtained from the District Forester, San Francisco, California, or the Forest Supervisor, Sisson, California.

STATE NEWS

CALIFORNIA

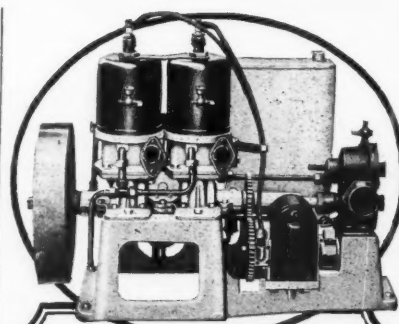
THE State Board of Forestry of California has asked the timbermen and lumbermen of that State to assist the board in carrying out a constructive forest policy and the latter have responded "we will."

As provided in the law adopted in 1919 the Board consists of four persons appointed by the governor—

"One of whom shall be familiar with the timber industry, one with the live stock industry, one with the grain and hay industry, and one at large, who, together with the State Forester, shall constitute the State Board of Forestry, which shall supervise and direct all matters of State forest policy, management and protection."

The Board met with the timbermen and lumbermen in San Francisco on Friday, November 5, and the President, former Governor George C. Pardee, in opening the meeting, stated that the Board has two particular objects—to protect and utilize the present forests to the greatest advantage and to provide forests for the future. In working to secure these objects the essential things are fire prevention and suppression and reforestation. He said that the first thing to be done is to provide for effective slash disposal as a means of preventing destructive fires, and asked the timber owners and operators present to pledge themselves to dispose of their slash in the most effective and practical way, according to the different conditions with which they have to deal. Everyone present agreed to do this and to keep the Board informed as to the best methods and the lessons learned by experience. From this it is planned to formulate a set of rules for slash disposal that will make it general and effective, and Dr. Pardee made it clear that the Board wishes these rules to come from the operators, arising out of their experience and observation, and formulated by the Board in co-operation with them. Ways and means for fighting forest fires and for reforesting cut-over lands will be worked out, the timbermen and lumbermen taking the initiative and co-operating in every particular with the State Board of Forestry.

Such hearty good will and confidential understanding assure perpetuation of the redwood and pine forests of California. The Board recognizes that the timber owners and lumber manufacturers are interested primarily in the present forests; and the timbermen and lumbermen, as expressed by several of those present, recognizes that the State is charged with duty of perpetuating the forests for the use and benefit of future generations. This mutual recognition of objects and interests will surely result in constructive plans of forestry that can be put into practice with-



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Portable, Lightweight Direct-Connected Gasoline Engines and Pumps for Fire Fighting

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out friction and with continual improvement from experience and observation.

As a further evidence of the spirit of mutual confidence and trust the timber owners and lumbermen voted unanimously to support the Board in its request to the next legislature for an appropriation of \$83,000 for fire fighting and \$150,000 for the purchase of cut-over lands. This will enable the Board to do its part in protecting the present forests and to start a system of state forests that will initiate both features of forest perpetuation in California.

NEW JERSEY

AN act of the Legislature of 1920 making mandatory the teaching of fire prevention one hour a month in all schools of New Jersey has made a new and valuable opening for forest fire propaganda. The text-book selected is the Fire Prevention Manual for the School Children of America, prepared by the National Board of Fire Underwriters, and the New Jersey edition has been supplemented by a chapter on Forest Fires, by State Firewarden C. P. Wilber.

The publication "Fighting Forest Fires" illustrated by photographs and diagrams, treating upon the forest fire situation in New Jersey and the remedy of the menace has met with such a popular demand that the first edition of 3000 copies was ex-

SOUTHERN PINE LUMBER INDUSTRY

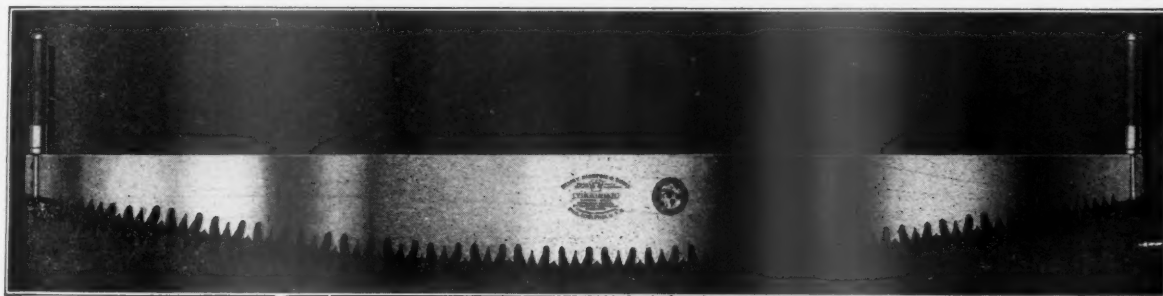
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hausted almost as soon as it came from the press.

Carl V. Raupach, a 1917 graduate of the New York State College of Forestry, at Syracuse University, has been appointed as an Assistant Forester in the New Jersey Department of Conservation and Development.

Because of the scarcity and high price of coal, State Forester Alfred Gaskill, of New Jersey, is urging farmers, woodlot owners and rural inhabitants to use cordwood when practicable. The many advantages of producing a home supply are pointed out; the saving of from \$5 to \$8 of the cost of a ton of coal, the profitable employment of farm hands and teams during slack time, the improvement of woodland by removing and utilizing inferior and crowded trees, the particular adaptability of wood as a fuel where a quick hot fire is wanted, as in cooking, and the value of wood ash as a potash fertilizer. It is estimated that at least 500,000 cords of wood could now be cut from New Jersey's two million acres of forest to the benefit of the woodland and to its greater security from fire. The utilization thereafter of an annual crop of approximately 200,000 cords of wood is urged and sought by proving to the rural inhabitants the advantages of cordwood over coal.

OHIO

MORE than 100 bushels of black walnuts are being gathered by the Department of Forestry at the Ohio Experiment Station at Wooster for planting in forestry nurseries this fall. This is the beginning of reforestation work by the State in growing black walnut.

Because of the heavy crop of walnuts this year, many land owners are advised to begin growing the valuable timber. The nuts may be planted any time before the ground freezes. They may be planted with husk on or hulled, as there is little difference in germination either way.

A peculiar characteristic of black walnut is that it is extremely intolerant and will not thrive in the shade of other trees.

A bulletin on growing black walnut is sent free to residents of Ohio on request.

WISCONSIN

P. C. CHRISTIANSEN, of Trout Lake, has been appointed Chief Ranger of the State Forestry Department to succeed E. M. Weaver, who was lately assigned to a position in the conservation department. The appointment was made by the Wisconsin Conservation Commission. For several years Mr. Christiansen has been in supervision of the Forestry Department's nursery at Trout Lake and is thoroughly familiar with the duties of Chief Ranger. Trout Lake will continue to be his headquarters.

FOREST FIRES AND LIGHTNING

OF a total of 102 fires handled so far this season in Seattle, Washington, 40 were caused by lightning. Losses of timber and logs aggregated about \$12,500 and logging equipment loss has been slightly more than this, says "The Forest Patrolman" of Portland. In the territory covered by the Potlatch Timber Protective Association, Idaho, out of 23 fires the last half of July, 20 were caused by lightning, and during the same period 30 out of 31 fires reported by the Clearwater Association, Idaho, were lightning fires. There have been no serious fires so far this season in Oregon.

The average annual loss in the United States from forest fires is about \$28,000,000.

Oregon, with one-fifth of the timber in the United States and the third State in lumber production, expends \$27,000 to maintain a State Forester and his assistants and carry on protection in the field; Washington, the leading State in lumber production, spends only \$10,000; while Maine, most of whose forests have been cut over several times, expends more than \$100,000 yearly for forest protection, and Minnesota about \$125,000.

ROTARIANS TO PRESERVE FORESTS

IMPRESSED by the startling figures presented them by forestry officials, the Colorado Springs Rotary Club has launched a nation-wide campaign to secure a constructive program of reforestation and federal appropriations sufficient to continue the necessary work, with special reference to forest experiment stations. A very interesting talk was made by A. S. Peck, District Forester of Denver, who is in charge of thirty forests in the Rocky Mountains. Mr. Peck said that less than one-half of the original stand of timber, here when the country was discovered, remains today, and only 30 per cent of that is virgin growth. The present production is 26,000,000,000 feet of timber a year, which is four times the annual growth. Four large areas of timber have been practically denuded, Mr. Peck pointed out, the present center of the industry being on the Pacific Coast—far from the big markets for the finished product. His statement that it took the product of 75 acres of forest to print the Sunday edition of a metropolitan newspaper excited considerable comment, as did the fact that in 1880 the per capita consumption of newsprint was three pounds a year while in 1919 it was 33 pounds—just 11 times as much.

Inspired by the message in the lines of "Forest Fires," by John D. Guthrie, S. Walter Krebs, the prominent young American pianist and composer, has set the poem to music and dedicated the song to the American Forestry Association. He first wrote it as a solo, but later arranged it as a quartette for male voices.

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It is the feature that sets this wonder machine above and apart from any other and makes it indeed "The Typewriter Plus." After all, in these days of progress, why should any one buy a noisy typewriter?

Sometimes a business man will say that he realizes the value of The Noiseless Typewriter but his only question is—"Will it stand up"?

In answer, we need but point to the thousands of machines that have been in constant daily use for four, five and six years! And to the list of users!

Reasons No. 2 and No. 3 are quite easily demonstrated. As a matter of

fact, stenographers who use The Noiseless Typewriter will tell you that they can do more work and better work on it than on any other machine they have ever used.

The Noiseless Typewriter brings you all the speed and efficiency of the ordinary typewriter and something more—the blessedness of quiet.

And it is on exactly that basis that we commend it to your attention.

As we have frequently stated, a fifteen-minute demonstration will tell you more about its value to you—to your nerves—to your stenographer—and to your business, than we could write in ten pages.

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WOOD PRESERVATIVE OUTPUT MAKES LARGE GAIN

INVESTIGATION by the Forest Service of the United States Department of Agriculture shows that the use of wood preservative has increased to a large extent in the United States. Valuable work on wood preservation has been done at the Forest Products Laboratory of the department at Madison, Wisconsin.

In 1919, there were 65,556,247 gallons of creosote, 2,412,592 gallons of paving oil, 102,011 gallons of miscellaneous preservatives used in the United States, in addition to 43,483,000 pounds of zinc chloride, the largest quantity of this preservative ever reported by the industry. Of the creosote, 6,493,000 gallons were imported.

Prior to 1917 the plants of this country depended upon foreign manufacturers for approximately 50 per cent of the creosote consumed. Most of this oil came from Germany and England. During the war, however, this supply was cut off, and the plants looked to domestic producers for their supply. Nearly all of the importations in 1919 were from England and Canada.

The material treated consisted of cross-ties, poles, wood blocks, crossarms, construction timbers, and miscellaneous materials, largely for railroads, mines, and telegraph and telephone companies. The total amount of wood subjected to preservative treatment by the 108 plants that were active during 1919 was 139,878,584 cubic feet, or 17,265,694 more than the previous year. About 80 per cent of this wood consisted of railroad cross-ties.

TIMBER-GROWING IN THE NORTH- WEST

IN the Northwest growing timber requires mainly two things: fire protection and revision of tax laws, says C. S. Chapman, of the Western Forestry and Conservation Association, in the *Oregon Voter*. Given these, continues Mr. Chapman, our lumber industry will be permanent, not vanishing.

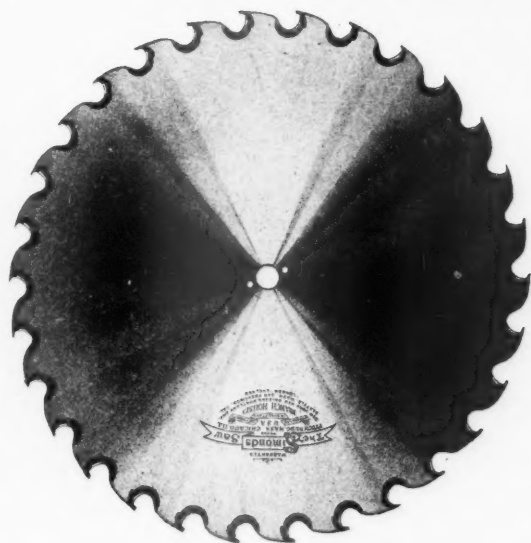
In no section of the country have private owners of timber put forward such effort and expended such sums to prevent forest fires as in the Northwest. The states have not been similarly progressive. States such as Maine, New York and Pennsylvania, once great lumber-producing sections, spend far more now to protect their meager forests than do northwestern states to protect their vast forest wealth.

In 1919 timber owners in the states of Montana, Idaho, Washington and Oregon expended over \$1,000,000 to protect their properties. The states expended less than \$100,000 other than in protection of state-owned lands, and the Federal Government's expense outside National Forests was under \$25,000.

SIMONDS

Inserted Tooth

S A W S



In every part of this broad land where mills demand the best in equipment, there you will find Simonds Saws of all kinds. For heavy work the Simonds Inserted Tooth saw leads all others because it is fast cutting, holds its tension and is most economical in the long run. When necessary the teeth can be easily removed and new ones inserted. It is a safe saw with a backing of Simonds finest saw steel, made in the Simonds Steel Mills.

Write for catalogue and prices.

SIMONDS MANUFACTURING COMPANY

"The Saw Makers"

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PAPER—THE VEHICLE OF EXPRESSION

AS important as the Printer who is commissioned to execute your work,—as important as the copy, the illustrations, the art work that pictures your commodity,—as important as all of these, is the PAPER that carries your message.

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FOR PENNSYLVANIA FORESTS

At an enthusiastic meeting of the Centre County, Pennsylvania, Conservation Association, at State College, Pennsylvania, recently remarks were made by Ralph A. Smith, of Sandy Ridge, the president, and by Colonel W. F. Reynolds, of Bellefonte; Colonel Theodore Boal, of Boalsburg, and Dean R. L. Watts, of State College, vice-presidents of the Association, and by a number of directors and members. Major R. Y. Stuart, Deputy Forestry Commissioner of the State, spoke of the present and future plans of the State Forestry Department, of the necessity of securing an appropriation of \$1,000,000 from the next State Legislature for protecting the forests from fire for the next two years, and of the plan for bonding the State for \$25,000,000 for extending the State ownership of forest lands. Believing that forestry is the foundation of the conservation problem in Centre County, it was the sentiment of the Association that every effort should be put forth to encourage the reforestation of denuded forest lands and their protection against fire, the planting up of farm woodlots, and the planting of trees around schools and churches and along the highways, and that all the various activities of the Association be encouraged. Resolutions were passed endorsing the forestry policy of the State Forestry Department, and agreeing to lend

every effort to the securing of an appropriation of money from the next Legislature that will adequately protect the forests from destruction by fire; and endorsing the plan to bond the State for \$25,000,000 for the extension of State ownership of forest land.

PINE BEETLE INFLECTS BIG DAMAGE TO SOUTHERN TREES

APPROXIMATELY \$20,000,000 damage was inflicted by the southern pine beetle in its attack on southern timber forests during two decades, according to investigations made by the United States Department of Agriculture concerning destruction caused by insect forest pests. Added to this damage is that of the black and the red turpentine beetle.

The hickory-bark beetle is found to be doing extensive damage in the northern tier of States from Wisconsin to Vermont and southward through the Atlantic States to central Georgia.

The department has issued three bulletins of particular interest to farmers who have hickory or pine trees on their lands. They are: "The Dying Hickory Trees, Cause and Remedy," Bureau of Entomology Circular 144; "The Dying Pine Trees, Cause and Remedy," Farmer's Bulletin 474; and "The Black Turpentine Beetle and Red Turpentine Beetle," reprint from Bulletin 83, Part I, Bureau of Entomology.

The department is urging farmers who use the slack time of late fall and early winter in getting in firewood to select trees that have been infested with insect pests.

FORESTS OF FRENCH GUIANA

IN spite of the enormous extent of the tropical forests of French Guiana, which cover an area equal to one-sixth of the surface of France, and in spite of the great variety of precious species of trees, the exploitation of the Guiana woods has been developed only to a very small extent, says "Fortnightly Survey of French Economic Conditions," published in New York by the French Commission in the United States.

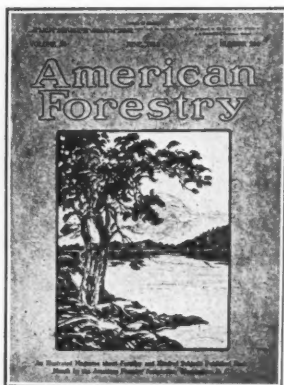
French Guiana is intersected by 22 rivers so that the problem of transportation may be easily solved, labor is abundant and cheap and in the marketing of forest products, the demand will always exceed the supply. The vast virgin forest of Guiana with its straight, high, enormously-trunked trees of mahogany, rosewood, tulipwood, ebony, cedar, satinwood, and more than 70 other species, is not only in itself a source of great wealth but the clearing of the forests will open the way to development of gold deposits whose value cannot yet be estimated.

Merchants and manufacturers of France are now organizing for serious enterprises in this new country.

BECOME A MEMBER

Any person may become a member of the American Forestry Association upon application and payment of dues.

PLANT TREES
PROTECT FORESTS
USE FORESTS



This is the only Popular
National Magazine de-
voted to trees and forests
and the use of wood.

FILL OUT THIS BLANK:—

American Forestry Association

1214 SIXTEENTH STREET N. W. WASHINGTON, D. C.

I hereby request membership in the American Forestry Association and enclose check for \$_____

INDICATE CLASS OF MEMBERSHIP

Subscribing Membership, per year.....	\$ 4.00
Contributing Membership, per year.....	10.00
Sustaining Membership, per year.....	25.00
Life Membership (no other dues).....	100.00
Annual Membership.....	1.00

Name

Street

City

FACTS ABOUT ALASKA

ALASKA has nearly as many varieties of climate as can be found in the Eastern and Middle Western States.

Manufacturers of pulp and paper in British Columbia and Alaska have little to fear from each other and much to gain in the common development of the Pacific coast region.

The permanent snow fields of Alaska only cluster round the crest lines of the highest mountain ranges, as they do in the Swiss Alps, and are less than one per cent of Alaska's total area.

The demand of the pulp industry is for an assured permanent supply of timber and properly allocated water power under stable tenure; both of these can be found in the Tongass National Forest, in southeastern Alaska.

Southeastern Alaska is favored with numerous deep water harbors open the year round with comparatively smooth waters in straits and passages. It is advantageously located with reference to shipments by rail and water to the United States and water shipments to the Orient, South America and Australasia.

"With her enormous forests of rapidly growing species suitable for pulp, her water power, and her tidewater shipment of manufactured products, Alaska will undoubtedly become one of the principal paper resources of the United States," says Secretary of Agriculture Meredith.

Aside from fuel, the more important operating supplies for pulp mills in general are lime or limestones, sulphur, soda ash, salt cake, grindstones, bleaching agents, and repair materials. Alaska has numerous known deposits of lime rock that would furnish very high grades of lime.

According to Government agriculture experts in Alaska, "it is possible to grow magnificent vegetables in all parts of Alaska, except on the tundras and mountains. To Alaskans they are no novelty, but to strangers unacquainted with the country they are a constant surprise."

LUMBER COMPARATIVELY CHEAP NOW

CALVIN FENTRESS, a member of a prominent firm of investment bankers of Chicago, has returned from a 9000-mile trip through the lumber manufacturing districts of the Pacific Coast, the Northwest, and South, where he has been in close personal contact with the industry. Mr. Fentress says, "It is greatly to the advantage of home builders, real estate operators, building contractors to buy lumber now. Hundreds of the smaller manufacturers throughout the country, no two

of whom are working under the same conditions, have dumped their lumber at prices which would bring them the quickest cash return, the natural result of the credit strain prevailing in every line of industry. "The present mill prices for lumber are bargain counter prices but it must be remembered only for the present stock of lumber on hand, as it is a certainty that the mill operators who have closed down will not resume operations to sell lumber at the present levels which are at or below the cost of production."

"Mill prices are 50 per cent lower than a year ago, meanwhile, under such conditions, a reaction in prices can be expected. The retail market for lumber will not reach the pre-war levels until wages and the cost of production are again on the same relative basis."

Big Money In Stump Land



H. G. Hunzicker, of Foster, Wash., pulling a 24-inch fir stump with deep tap roots out of hard ground.

This man made \$35 Land Worth \$200 an acre Pulling Big stumps by hand

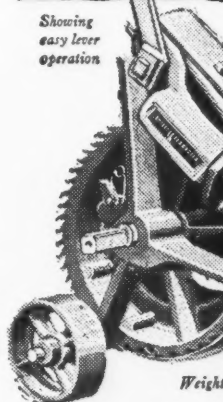
CLEAR your stump land cheaply—no digging, no expense for teams or powder. Your own right arm on the lever of the "K" Stump Puller can rip out any stump that can be pulled with the best inch steel cable. I guarantee it. I refer you to U. S. Government officials. I give highest banking references.

HAND POWER K Stump Puller

One man with a "K" can outpull 16 horses. Works by leverage—same principle as a jack. 100 lbs. pull on the lever gives a 48-ton pull on the stump. Made of best steel—guaranteed against breakage. Has two speeds—60 ft. per minute for hauling in cable or for small stumps—slow speed for heavy pulls. Works equally well on hillsides or marshes where horses cannot go.

Write me today for special offer and free booklet on Land Clearing.

The Fitzpatrick Products Corp.
Box 43
99 John St., New York
Box 43
16th and Kansas Sts.
San Francisco, Cal.



Weight, without cable, 171 pounds

No Stump Too Big For The K

CANADIAN PARKS

CANADA'S magnificent scenery comprises one of her proudest possessions. While such a possession should not be appraised purely from a commercial standpoint, it is, nevertheless, a conservation policy of the most practical character to take steps to assure that this natural resource be administered as an economic asset. In so doing, the Dominion Parks Branch merits recognition as a very substantial factor assisting to maintain the solidity of Canada's financial standing. It is, in addition, a foremost agency in providing sanctuaries, in administering game laws and in otherwise contributing to the practical program essential to prevent the depletion of our wild life resources.—Conservation.



further WAR DEPARTMENT *Corned Beef* No.1 Cans **15¢**

AT this unprecedented low price there will be a tremendous demand from coast to coast, for this GUARANTEED PURE, wholesome canned corned beef.

Millions of people realize the GENUINE SAVINGS resulting from the purchase of this delicious, nourishing meat, and want more—AND STILL MORE!

Where Can They Get It?

That is the query that is received in every mail, from people who have followed the Government's extensive advertising in local papers everywhere.

The War Department has arranged to have dealers display in their windows colored posters picturing Uncle Sam attacking the high cost of living to guide these millions of buyers. Will YOU be one of the DEALERS who will profit by this publicity?

This poster and other advertising material, including newspaper advertising, will be sent on request.



CHIEF, SURPLUS PROPERTY BRANCH

Office of the Quartermaster General

Munitions Building, Washington, D. C.



BUY WAR DEPARTMENT

Buy it by the Carload—Freight prepaid

reductions IN CANNED MEATS



BUY THESE MEATS AND TELL YOUR CUSTOMERS YOU HAVE THEM

This is a great opportunity to dealers. If you haven't already bought some of these meats buy them now. If you have bought them, buy more. Tell your customers of this unusual opportunity for them to save on their living cost.

NOTE THE NEW LOW PRICES. MINIMUM ORDER ACCEPTED \$250

CORNED BEEF:		CORNED BEEF HASH:	
No. 1 cans.....	15c. per can	1 lb. cans.....	15c. per can
No. 2 cans.....	27c. per can	2 lb. cans.....	30c. per can
1 lb. cans.....	18c. per can		
6 lb. cans.....	\$1.00 per can		

TABLE OF DISCOUNTS

Discounts to apply on all purchases of surplus canned meats on and after November 15 are as follows:

	Net
\$ 250.00 to \$1,000.....	5%
1,001.00 to 2,500.....	10%
2,501.00 to 4,000.....	20%
4,001.00 and over.....	

If value of full carload (shipped at Government expense) is less than \$4,001 then 20% discount will be allowed on the value of the carload.

CUMULATIVE PURCHASES COUNT

To stimulate purchases of carload lots and to promote sales in large quantities, further discounts as follows are authorized to customers ordering or re-ordering in carload lots. The value of all purchases of canned meats made on or after November 15, 1920, only, to be considered in connection with this scale of discounts.

When purchases reach \$ 50,001.....	24% net to prevail
When purchases reach 100,001.....	28% net to prevail
When purchases reach 500,001.....	32% net to prevail
When purchases reach 1,000,001 and over.....	35% net to prevail

The foregoing means that the total purchase by a customer in carload lots from time to time will be taken into consideration and the proper discount applied on the sum of all the purchases, including the first carload lot.

CREDIT SALES

Depot Quartermasters are authorized to sell surplus canned meats for cash, bankers' acceptance, or on not to exceed ninety (90) days straight credit in the commercial sense. Credit will be extended only to those individuals, firms or charitable organizations which can establish a satisfactory credit rating (Dunn's, Bradstreet's or Bank's), or to Municipalities having a bona fide purchasing organization. The credit risk in each case is left to the decision of the Depot Quartermaster.

FREIGHT PREPAID

Shipments of not less than carload lots will be made at government expense to any point in the United States outside a radius of 20 miles of the point of storage from which shipment is made. The Government will not be liable for any demurrage or switching charges that may accrue after goods are loaded for shipment. Prices quoted are in all cases f. o. b. storage point, with freight prepaid, as above specified on carload lots.

SAMPLES ON REQUEST:

Depot Quartermaster in your district, will, on receipt of price of samples wanted and postage costs, be glad to send same to prospective purchasers in their respective zones.

GUARANTEED CONDITION:

The Government guarantees to deliver all meats in perfect condition. The most rigid inspection will be made of each shipment before it leaves point of storage, thus insuring full protection of all purchasers.

ORDER NOW

Send Orders to Nearest DEPOT QUARTERMASTER at the following addresses:

Brooklyn, 59th St. and First Ave.	Atlanta, Ga., Transportation Bldg.
Boston, Mass., Army supply Base.	San Antonio, Tex.
Chicago, Ill., 1819 West 39th St.	San Francisco, Calif.

Surplus Property Branch

Office of the

Quartermaster General,

Munitions Building - - - Washington, D. C.

CANNED MEATS

Buy it by the Carload-Freight prepaid

FORESTERS ATTENTION

AMERICAN FORESTRY will gladly print free of charge in this column advertisements of foresters, lumbermen and woodsmen, discharged or about to be discharged from military service, who want positions, or of persons having employment to offer such foresters, lumbermen or woodsmen.

POSITIONS WANTED

WANTED—Position as Forester and Land Agent. Technically trained forester, 35 years old. Practical experience along all lines included under the duties of the above positions. Former Captain, Field Artillery. Address Box 840, care American Forestry, Washington, D. C.

A FORESTRY graduate with several years experience in forest work and at present employed along technical and administrative lines desires responsible position with private concern operating in and outside the United States. Address Box 870, care of American Forestry Magazine, Washington, D. C.

RECENTLY discharged from U. S. Army, young man wants position with a firm who has use for a lumber tallyman and inspector. Has a good education, 11 years' practical experience in lumber and can furnish good references. Address Box 880, care of American Forestry Magazine, Washington, D. C.

GRADUATE of the Ranger Course of the Lincoln Memorial University, Harrogate, Tennessee, wishes to secure work as a forest ranger or guard. Twenty-four years old. Address Box 965, care American Forestry, Washington, D. C. (11-1-21)

POSITIONS OPEN

WANTED an Assistant City Forester, must have had some technical training and sufficient practical experience to direct the work in a city of 150,000. Answering give all information necessary for immediate consideration of application. Box 970, American Forestry Magazine.

WANTED—Two technically trained foresters. One as Assistant Forester for technical work with headquarters at Trenton, New Jersey, and one as Division Firewarden with headquarters in northern part of State. Firewarden to own and operate automobile for which liberal mileage charge is paid. Salary to start \$1,500 and field expenses. If unwilling to apply at this figure submit applications stating minimum salary. Address Department of Conservation and Development, C. P. Wilber, State Firewarden, State House, Trenton, New Jersey.

POSITION OPEN in one of the fastest growing cities of the South West for a trained City Forester. State age, salary expected. Answer in own handwriting. Box 3000, American Forestry Magazine.

WANTED—An assistant forester. Good place offered for a recent graduate who would like to get in business for himself in an excellent location. Address Box 920, AMERICAN FORESTRY MAGAZINE. (8-10-20)

WANTED: A married man with small family, with technical forestry training and practical experience, also having some knowledge and experience in farming and with farm machinery, to act as forester and superintendent of private forest estate of 500 acres in eastern Connecticut. House provided with modern conveniences. A good position for a good man. Address, Box 975, Care AMERICAN FORESTRY

School of Forestry

UNIVERSITY OF IDAHO

Four Year Course, with opportunity to specialize in General Forestry, Logging Engineering, and Forest Grazing.

Forest Ranger Course of high school grade, covering three years of five months each.

Special Short Course covering twelve weeks designed for those who cannot take the time for the fuller courses.

Correspondence Course in Lumber and Its Uses. No tuition, and otherwise expenses are the lowest.

For Further Particulars Address

Dean, School of Forestry
University of Idaho
Moscow, Idaho

WANTED

A capable man experienced in tree surgery, forest conservation and light lumbering, on a large estate in Bath County, Virginia. Salary to start \$1,500, room and board.

Address, CHIEF ENGINEER
Box 99 HOT SPRINGS, VA.

THE ANNUAL MEETING

THE annual meeting of the American Forestry Association will be held in Washington, D. C., on January 24, 1921, in accordance with the by-laws, and will be adjourned to reconvene on February 25, at which time the committee on revision of the by-laws will be ready to report.

By order of the Board of Directors,

P. S. RIDSDALE,
Secretary.

DIRIGIBLE BALLOONS FOR FOREST FIRE FIGHTING

MILLIONS of dollars' worth of valuable timber has been saved the Government during the season just closed, by the use of airplanes in forest fire fighting, says a San Francisco dispatch. Fires can be so accurately plotted by wireless from the planes that fire fighters can be directed to within a quarter of a mile of the exact location. Plans are now being made for the enlargement of the airplane patrol service for next season. It is also proposed to employ navy dirigible balloons for trans-

porting fire fighters from the fire control stations to the fire. Men, with all equipment, will be loaded into the dirigible, taken directly to the scene and dropped by means of a long rope ladder. Aside from the saving of millions of dollars to the nation, the service is training, for future emergency, scores of army flyers.

NEW FOREST SERVICE DISTRICT IN ALASKA

THE establishment of a new field district comprising the Chugach and Tongass National Forests in Alaska, with headquarters at Juneau, is announced by the Forest Service, to take effect January 1, 1921. The new district will be in charge of District Forester Charles H. Flory, who is at present Superintendent of National Forests in Alaska. The establishment of the new district was decided upon in order to facilitate the transaction of the growing business of the two Alaskan National Forests, and is in line with the policy of decentralized administration of the Forest Service. Nearly all of the business of the Alaskan forests will be transacted in the future on the ground by the district forester and the local forest officers, the officials of the Forest Service state.

FOREST ASSISTANT EXAMINATION

THE United States Civil Service Commission announces an open competitive examination for Forest Assistant on January 5 and 6, 1921. Vacancies in the Indian Service at \$1,100 to \$1,200 a year, and in positions requiring similar qualifications, at these or higher or lower salaries, will be filled from this examination, unless it is found in the interests of the Service to fill any vacancy by reinstatement, transfer or promotion.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C., or to the Secretary of the United States Civil Service Board, Forest Assistant, Indian Service.

PRACTICAL INFORMATION FOR WOODLAND OWNERS

IN response to a widespread demand for fundamental and practical information on forestry presented in untechnical language, the United States Department of Agriculture has just published Department Bulletin 863, "Forestry Lessons on Home Woodlands."

This bulletin is in the form of lessons for school use; but it contains a wealth of up-to-date information on the principles and practice of forestry that will meet also the requirements of the farmer and the general public. The farmers of the United States own more timberland than all other private timberland owners put together and the proper handling of their woodlands will go a long way toward checking the shrinkage in our timber supply

